

# Railway Age Gazette

DAILY EDITION

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The two points brought most prominently to the front in President Clark's address were the improvement in the matter of delays of cars and the application of the new federal safety appliance act and its probable effects. As for the delays, which certainly form a very great source of expense and embarrassment to the railways, no remedy was offered and the speaker contented himself with merely counseling conservatism, on the ground that the M. C. B. Association is too big, too powerful and too influential to do anything that savors in the slightest of hasty and ill-considered action. The question is not one that is easy of solution by such experts as compose the association. To the layman and novice it is very simple and easy. The matter was discussed some time ago at one of the railway clubs, and the railway men touched the matter rather gingerly, not exactly seeing their way clear to a solution, until a professor told them exactly what they should do and how they should do it. And, presto! the air was cleared. Then a railway manager told this story: Once there was a woman who had a very bad boy; so bad that she could do nothing with him. She had prayed for and with him in labor and travail. At last she bethought herself of her minister, to whom she betook herself and told her woes. He listened sympathetically and then said: "My dear madame, I am very sorry for you, but I do not see that I can do anything. You see, I have children of my own, and the only thing I can suggest is that you go to some old maid who has never had any children." So the cure for the wickedness of car delays seems to be beyond the power of the regular minister, but we may hope that something may be suggested that will make it possible to do better than any road can do to-day, and thus add one more to the many economies due to the M. C. B. Association.

As for the effects of the safety appliance law, the president indicated that a spirit of fairness seemed to animate the representatives of the Interstate Commerce Commission in their dealings with the committee of the association. It is to be hoped that this spirit will continue to be dominant. The M. C. B. Association forms the most expert body of men in the world in the matter of car construction and maintenance, and what it has decided upon as proper for a standard should be treated with the respect, one might almost say reverence, which the source from which it emanated ought to inspire. Its standards of sill steps, grabirons, handholds and the like have only been adopted after long and painstaking effort and it could only be the boldness of ignorance and inexperience that would dare to arbitrarily tamper with them. The new law gives wide powers to the Interstate Commerce Commission, so broad that it should think hard and long before exercising them in their full extent. It has the power to step in and at one fell swoop do away with the results of decades of work by this association. But, if it will remember that nothing has been done without paramount attention having been given to the safety of employees, and with a degree of care that the employees or their direct representatives are incapable of giving for themselves, it probably will simply adopt the standards that have been established, and do it in a way that will leave the association still as free as it has been in the past to modify, and change, as requirements change. If it shall do this it will show itself possessed of a broadness and wisdom that, unfortunately, does not always characterize public commissions. It can honor itself and help the railways and the country by giving a liberal interpretation to the law. It remains to be seen whether it is big enough and broad enough to take advantage of the opportunity that is thus afforded it.

Whether the alarm on the subject of the abuse of the repair card that was stirred a year ago or not was without foundation need not be discussed. According to President Clark's address, the improper use of it has now stopped. When, in the whole wide range of applications of that useful document during the past year, but one instance was brought forward of possible impropriety, it speaks well for the general honesty of purpose that now inspires the members of the M. C. B. Association and their subordinates. It is quite possible that, in the past, overzealous inspectors and foremen did not do just the square thing in the use of the card, but it is a magnificent showing for the association that the moment attention is called to what would be a real evil, it ceases to exist.

The report and discussion on the Revision of M. C. B. Standards indicates the lack of responsibility which must result from legislation which in effect makes this committee advisory to the Interstate Commerce Commission. Desired changes in the standards are referred in a haphazard manner to the special committees in charge of those standards. An illustration of the practical working of this method is seen in the design of one of the most important standards of the association, the coupler. The butt end of the coupler and its attachment to the yoke has been changed in some way nearly every year, and it is still unsatisfactory and unsettled. The increase in the clearance for the standard 8-in. spring from  $\frac{1}{4}$  in. to  $\frac{1}{2}$  in. has been recommended because it is found that some railways have adopted a butt length to provide for this larger clearance. It is time that the design of the coupler yoke and its attachment should be revised, and its shape and proportions made such as would be dictated by good engineering, and not allowed to be slightly altered year after year on traditional lines which are no longer suited to the severe conditions of present service. The railway supply men are developing such designs more rapidly than the car builders and while uniformity

of standards cannot be obtained by such methods, as President Clark suggested in his address, "it is an injustice to always insist on uniformity where it is not essential to safety." Another evidence of a lack of thoroughness in the report on Revision of Standards was the recommendation of dimensions for fluted roofing for double board roof. This was shown to be incorrectly figured and to be unnecessary, as wooden roofs are rapidly going out of use. The report in general deals with too many details which can be grasped and taken up for profitable discussion at a convention, and it would appear that the revision of the more important standards could be more successfully accomplished by referring them to special committees for that purpose.

#### THE REQUIREMENTS FOR IMPROVED PASSENGER BRAKES.

The weight of passenger cars has been materially increased during the past ten years. The railways have scarcely realized that the efficiency of the brakes has not kept pace with that increase, nor that the distance required for a modern express train to stop when running 60 miles an hour is 25 to 50 per cent. greater than it was with the same number of cars in 1900. That is, the stop from a speed of 60 miles an hour was then made in 1,000 ft., while now, with ordinary brake equipment, it requires 1,500 ft. Before any large amount of heavy steel equipment is built, it is desirable to bring up the brake efficiency so as to make the stop from 60 miles an hour in not over 1,200 ft.

On account of the limitations of brake shoe pressure and the low coefficient of friction at high speed, advantage must be taken of quick application with little lost motion and of possible improvements in the triple valve. The foundation brake requires careful investigation and some modification in order to accomplish the desired object with cars weighing 130,000 lbs. and over. Realizing the importance of prompt action, the M. C. B. executive committee instructed the air brake committee to take up the question of a new design for foundation brakes with the railways and the brake manufacturers.

The difficulties confronting the brake companies may be briefly described: The 18-in. cylinder and lever ratio of 9 to 1 is sufficient for cars up to 127,000 lbs. Above this, a brake power equivalent to a 20-in. cylinder is required. Cylinders of this size are objectionable for several reasons; first, on account of the increased distance of the center of the cylinder from the car sills and the greater stress due to this longer lever arm; second, because of the increased leakage due to difficulties in getting leather packings of sufficient uniformity; and third, because the heavy piston rods require a larger percentage of the brake power to move them. Various methods of obtaining sufficient brake power without the use of a large 20-in. cylinder have been suggested. These are: first, that two cylinders 14 in. in diameter could be used, one at each end of the car, but it would be difficult to operate two cylinders with one triple; second, it has been proposed to place the brake fixtures on the trucks with one or two cylinders on each truck, thus requiring a flexible joint between train pipe and cylinder; plans for such an arrangement have been worked out and applied experimentally on one of the western roads; third, clasp brakes with two brake beams and four shoes to each pair of wheels have been suggested, and there is no doubt but that this is a practical method of overcoming the objection of excessive brake shoe pressure by increasing brake shoe area, but the experience with the clasp shoe in the past seems to discourage its use in the present dilemma.

A sub-committee reported certain coefficients and factors involved in the problem of stopping a train from 60 miles per hour in 1,200 ft. The brake power is derived as follows: The work or energy in the moving mass is  $\frac{1}{2} M V^2 = \frac{WV^2}{2g}$  where  $V = 88$  ft. per second;  $W =$  wt. of car, and  $g = 32.2$ . Then work =  $\frac{WX88^2}{64.4} = 120 W$  and  $= \frac{120 W}{1200 \text{ ft.}} = 1/10$

$W$  or 10 per cent of wt. of car = brake power required. The efficiency of the brakes on the engine and tender is much less than that on the cars, and where the energy of the whole train, engine and cars is concerned some modification must be made in the percentage of the total weight to be used as a figure for brake power. It is necessary to assume also some relation between the weight of the engine and the total weight of the cars. The committee agreed to take the weight of cars as twice that of the engine and tender, and the weight of the whole train is, therefore, three times that of the engine and tender. Assume also that the engine and tender brakes have only half the efficiency of the car brakes. Then, if the latter is taken as 100 per cent, the brake effect of the whole train will be in the ratio of 5 to 6. To stop the whole train in 1,200 ft. would, therefore, require brake power on cars to have a capacity sufficient to stop them in 1,000 ft., and this is equal to a retarding force of 12 per cent of their weight.

The committee decided that the maximum pressure per brake shoe should be 18,000 lbs., or 400 lbs. per square inch. The laboratory tests of plain cast iron brake shoes under this pressure at 60 miles per hour gave a coefficient of friction as low as 8.4 and as high as 13.2 per cent. It was decided from this showing that 10 per cent would be a fair average coefficient of friction. The efficiency of the brake gear was taken at 85 per cent to compensate for friction and other losses. It was estimated that the load, consisting of baggage, passengers, etc., is approximately 7 per cent of the weight of the cars. A further adjustment was made because of the fact that when running at 60 miles per hour, after the engineer has started to operate the brake, the train will run about 200 ft. before the brakes are in full application. This reduces the distance of 1,000 ft. to 800 ft., which, in connection with the 7 per cent load, requires a retarding effect equal to 16 per cent of the weight of cars.

With this final factor it was decided that for 85-lb. cylinder pressure an 18-in. brake cylinder would be sufficient for sleeping cars weighing up to 114,000 lbs. and coaches weighing 100,700; two 14-in. cylinders should be used for sleepers weighing 138,000 lbs. and coaches weighing 130,000 lbs.; two 16-in. brake cylinders are required for sleepers weighing 180,000 lbs. The brake beams should not deflect more than 1/16 in. under maximum emergency brake load, and should not take a permanent set under 50 per cent in excess of that load. When two brake cylinders are required they should be attached to the car body, and the air brakes and hand brakes at their respective ends should be entirely independent. The two cylinders may, however, have, if preferred, but one triple or control valve and one reservoir.

As the equipment here recommended had not been tested in service, it was decided that a demonstration be made by actual road tests of trains corresponding to those used in making the calculations, equipped with brakes as described, and that accurate measurements be made of speeds, pressures, distances, etc. The Toledo tests on the Lake Shore, resulting from these recommendations, form the basis of the final report presented at this convention of the M. C. B. Association.

#### EROSION OF A GASKET UNION.

LEXINGTON, MASS., June 4, 1910.

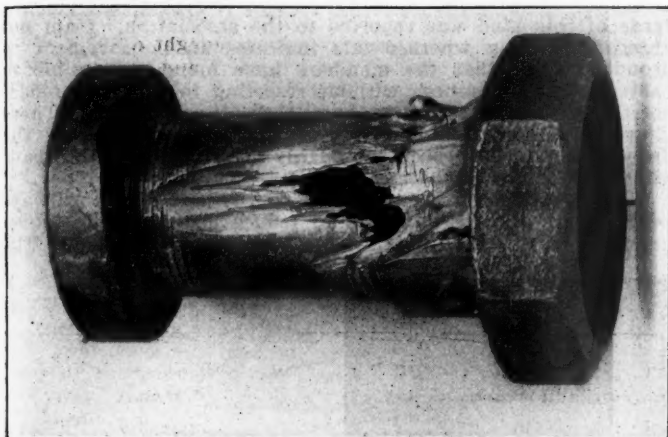
TO THE EDITOR OF THE DAILY RAILWAY AGE GAZETTE:

The accompanying photograph shows what is left of a gasket union we were called upon recently to replace with one of our brass to iron seated unions.

The remarkable feature in connection with the erosion of this union is the fact that it was taken out in the condition shown only three weeks after it had been installed. True, it was called upon for pretty severe service, as it connected a steam trap to a 6-in. water leg 440 ft. from the boiler, carrying steam which was delivered to the engine at 130 lbs. pressure. The trap and joint were located in a brick and

cement pit and were covered with water in which there was considerable sand and grit.

The explanation that occurs to us of how this happened is that the escaping steam stirred up sand and grit, which was sucked into the current of escaping steam and the combination



A Peculiar Case of Erosion.

worked like a sand blast. We would like to know if any of your readers ever had a similar experience, or if any one can offer an explanation other than the above.

JEFFERSON UNION COMPANY.

#### TODAY'S PROGRAM.

M. C. B. ASSOCIATION.  
Morning Session.

##### Discussion of Reports on:

Rules of Interchange.....	10:00 A. M. to 10:30 A. M.
Coupler and Draft Equipment.....	10:30 A. M. to 11:00 A. M.
Car Wheels .....	11:00 A. M. to 12:00 M.
Safety Appliances .....	12:00 M. to 12:15 P. M.
Freight Car Trucks .....	12:15 P. M. to 12:30 P. M.

Adjournment.

Afternoon Session.

##### Discussion of Reports on:

Splicing Underframes .....	2:00 P. M. to 2:30 P. M.
Car Framing, Roofs and Doors.....	2:30 P. M. to 3:00 P. M.
Tank Cars .....	3:00 P. M. to 3:30 P. M.
Train Pipe and Connections for Steam Heat .....	3:30 P. M. to 4:00 P. M.

Adjournment.

#### ENTERTAINMENTS.

10:30 a.m.—Orchestra concert, Entrance Hall, Million Dollar Pier.

3:30 p.m.—Orchestra concert, Entrance Hall, Million Dollar Pier.

9:30 p.m.—Forty-fourth annual ball of the Master Car Builders' Association, Entrance Hall, Million Dollar Pier.

#### SOCIETY OF RAILWAY CLUB SECRETARIES.

The Society of Railway Club Secretaries will hold its annual meeting at the Marlborough-Blenheim Hotel, June 18, at 10 a. m. The annual dinner will be held on the evening of the same day, the place to be announced later. A move is on foot to form an organization to be known as the American Association of Railway Secretaries, the membership to include the secretaries of all railway organizations, except such as are identified with organized labor. It is quite probable that the Society of Railway Club Secretaries will decide to affiliate with, or at least become a railway club section of, this new organization.

## Proceedings.

The first session of the forty-fourth annual meeting of the Master Car Builders' Association was held in the Greek Temple, on Young's Million Dollar Pier, Atlantic City, N. J., on Wednesday, June 15, 1910.

The president, F. H. Clark (C. B. & Q.) called the meeting to order and invited the past presidents and the present officers of the Master Mechanics' and the Master Car Builders' Associations to be seated on the platform. The mayor, Franklin P. Stoy, welcomed the convention to Atlantic City. W. E. Fowler, a past president, replied to Mayor Stoy on behalf of the association.

President Clark then addressed the meeting as follows:

#### ADDRESS OF PRESIDENT CLARK.

It gives me great pleasure, in opening the forty-fourth annual meeting of the Master Car Builders' Association, to extend a word of greeting to the members and their friends here assembled. Many of you have attended our previous meetings, and your presence today indicates that you have found them either pleasant or profitable. Let us hope that we may all derive both pleasure and profit from this one. Most of our members come here because it is considered that they and the railways they represent are benefited by their presence. I have no reason to doubt that their anticipations will be realized, but I want to suggest that they all contribute something in the way of information and encouragement to the association; that they give as well as receive. Most of the work of the association is necessarily borne by a comparatively small number of its members, but they need assistance in our annual meetings, in conferences and in committee work.

I do not intend this morning to take the time of the association to comment upon the committee reports that will be presented later for your consideration, though perhaps I might avail myself of the privilege usually accorded your president of suggesting to members of committees that their reports would be of greater value if submitted somewhat earlier to the secretary so that they will reach the members in time that they may study them. Our by-laws, as you may know, provide that reports of committees should be in the hands of the secretary by April 1, in order that he may get them out by May 1. From the fact that the reports reached the members about five weeks late, I assume that they were not all in by the first of April.

There are a number of matters concerning the work of the association of which you may not be informed, and which will not be covered by committee reports. One of the most important of these seems to be the present status of the safety appliance question as reported in full by our safety appliance committee. Congress passed a bill about two months ago, which received the signature of the President, and which provides that within six months from its passage the Interstate Commerce Commission, after hearing, shall designate the number, dimensions, location and manner of application of sill steps, hand-brakes, ladders, running boards and other parts mentioned in previous safety appliance acts. This bill provides that the rulings of the Interstate Commerce Commission shall be effective July 1, 1911, and that the commission may, upon full hearing and for good cause, extend the time after which any common carrier may be required to comply with the provisions of the act. The commission is also given authority, after hearing, to modify or change, and to prescribe the standard height of drawbars and to fix the time within which modification or change shall become effective. It was suggested about the time the bill passed that the hearing could be materially shortened and better results obtained if a conference was arranged between a committee of your association and the inspectors of the Interstate Commerce Commission, they to represent the commission; and, as the idea met with favor by Mr. Moseley, secretary of the Interstate Commerce Commission, and your executive committee, a special committee was appointed for the purpose. The American Railway Association authorized this committee to give such attention as might be necessary to the question of drawbar heights, a matter that had previously been handled by that association. A preliminary meeting on the whole subject was held on May 24, and subsequent meetings on June 6, 7 and 8, and, as a member of that committee, I would like to testify to the fairness and earnestness of purpose evidenced on both sides. I think it very likely that the final result will be a considerable expenditure of money on the part of the railways in bringing old equipment up to the desired standards, but it seems likely that at the public hearing the Interstate Commerce Commission will grant the rail-

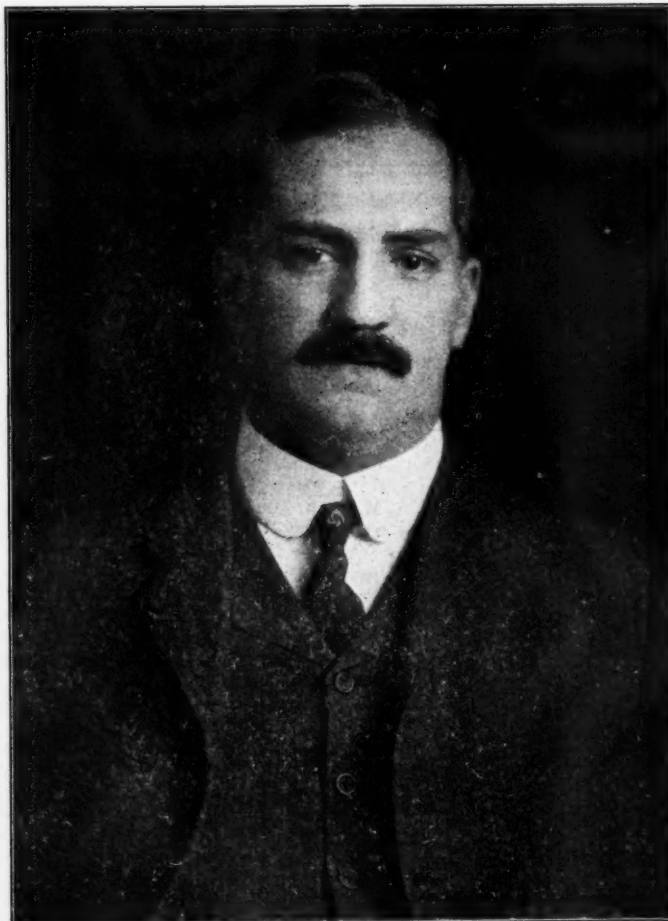
ways reasonable time to make their existing cars comply with the rules which they will prescribe. A public hearing on height of drawbars was held by the Interstate Commerce Commission on the 7th of the month, and it is understood that an order will probably be issued prescribing  $34\frac{1}{2}$  inches as the maximum height and  $31\frac{1}{2}$  inches as the minimum height of couplers on standard gage freight equipment, 26 inches as the maximum and 23 inches as the minimum height on narrow gage freight equipment, except for two-foot gage, where a maximum height of  $17\frac{1}{2}$  inches and a minimum height of  $14\frac{1}{2}$  inches is proposed.

This, I believe, will clear up the misunderstanding as to the intent of the present law, which has been given an interpretation somewhat at variance with the ideas of its framers.

It is probable that the public hearing on other details will be postponed until the early Fall in order that the conference committees may be given all the time that will be necessary in which to reach their final conclusions. If in the end there

abuse of the repair card, and, as the matter was one which could not under our rules be properly handled by the arbitration committee, a resolution was passed asking that any member of the association having evidence of dishonesty in the use of the repair card should submit it to the executive committee, which would undertake to investigate the matter and handle in such manner as seemed to be to the best interest of the association. I am pleased to report that but one case of this kind was reported to the association. I am not prepared to say whether this indicates an improvement in conditions, or that the members have found it possible to adjust their differences without resorting to the good offices of the executive committee, but it has a hopeful look. There have been some claims made of sharp practice during the past year that have been thoroughly investigated by the roads interested and the charges definitely disproved.

There has been a general effort on the part of the railways during the past year or two to reduce delays in the movement of cars, and so obtain more use of the equipment. The



F. H. Clark.  
President, M. C. B. Association.

are any points of difference between the office is of the commission and the representatives of the railways, they will no doubt be settled by the commission at that time.

As I have already suggested, the orders of the commission may involve the railways of the country in considerable expense, this on account of the lack of uniformity in the application of safety appliances to our cars, and this is largely due to the fact that in some cases our safety appliance rules have not, until recently, covered some types of construction with sufficient clearness. Unfortunately, also, the association has not been in a position to enforce its rules, so that some variations have been allowed to continue which should have been corrected. The whole matter is now in the hands of the Interstate Commerce Commission, and your committee may regard itself, I suppose, as an advisory committee to that body. Where questions of safety are clearly involved there cannot very well be any serious differences of opinion, but the committee will take occasion to urge upon the officers of the commission the injustice of requiring uniformity when not essential to safety.

You may remember that at the last meeting of the association there was considerable discussion on the question of

discrepancy between the average mileage of cars in motion and the average daily mileage is so great that it seems that an increase should be possible. Delays are due to various causes, most of which would not be affected by any action we might take. The matter of delays to cars in interchange is one over which we have some control, and one to which the officers of your association, and the arbitration committee in particular, have given a good deal of attention. It is to be hoped that our rules may be finally so framed that, without working an injustice to the owners, the movement of cars can be somewhat expedited through interchange points. We may not be able, under the rules now proposed by the arbitration committee, to eliminate unnecessary delays altogether, but it is often better to move cautiously in matters of this kind and gradually bring about the desired result than to make radical changes which will bring about confusion and general dissatisfaction.

It is quite possible for this association to take such action as to cause railways considerable unnecessary expense, and such action has occasionally been taken. The possession of power and authority should lead to conservatism, and this association is too powerful, and has too much authority, to

warrant it in taking radical action on matters having to do with rules or standards without careful consideration.

Our committee on consolidation, working jointly with a similar committee of the American Railway Master Mechanics' Association, will present a report, as instructed, on the advantages and disadvantages of consolidation, together with a proposed constitution and by-laws. This is an important matter and one which should not be settled without a full comprehension of the points at issue. The matter has been proposed before, but the subject has never been brought to the point at which it now stands. I hope that it will receive your most careful consideration and that we shall all approach the subject without prejudice.

I am sorry to say that during the year death has claimed the following members of the association: J. J. Ellis, P. H. Peck and J. F. Divine.

Owing to the fact that the Master Car Builders' Association is an unincorporated body it will probably be unable under the laws of the State of New York to receive the Tilletson legacy of \$5,000, bequeathed by the widow of a former member of this association.

I wish to thank you in closing for the privilege of presiding over your meetings, and for the assistance rendered during the year in conducting the affairs of the association.

Secretary Taylor then presented his report, which showed the membership to be as follows: Active members, 377; representative members, 332; associate members 14; life members, 19; total membership, 742. The number of cars represented compared with last year is as follows: June, 1909, 2,403,961; June, 1910, 2,298,633.

The secretary announced the deaths during the year of J. J. Ellis, P. H. Peck and J. F. Divine, active members.

The statement of receipts and expenses showed an income of \$16,509.50 and expenses, amounting to \$15,919.29, leaving a balance of \$590.21.

During the year fourteen railways and private car lines have signified their desire to become subscribers to the rules of interchange governing freight cars. Nine railways and private car lines have advised of their acceptance of the code of rules governing the interchange of passenger equipment.

The report of the treasurer presented by the secretary, showed a balance on hand June 10, 1910, of \$1,127.82.

President Clark presented the following communication from the treasurer, John Kirby:

I ask you to accept my resignation as treasurer of this association. I have held office for several years and now ask that you elect a younger man in my place who will attend to the duties of the executive committee. I have been an active member of this association from its infancy. On the nineteenth of September, 1866, the following persons met in my office at Adrian: Rural Dean, of the Boston & Worcester; Calvin Stebbins, of the Western Railroad of Massachusetts; R. V. Coon, of the Troy & Boston; Leander Garey, of the N. Y. & Harlem; J. W. Van Houton, R. S. Ramsey, John P. Levan, Pennsylvania Central; George Shattuck, Rome, Watertown & Ogdensburg; Joseph Jones, New York Central; F. D. Adams, Buffalo & State Line; N. H. Marsh, Cleveland, Painesville & Ashtabula; C. H. Copeland, Cleveland & Toledo; and John Kirby, Michigan Southern & Northern Indiana. Chairman, John Kirby; secretary C. P. Nichols, of the Western. J. W. Van Houton suggested that the master car builders form an association to be called the Master Car Builders' Association of the United States.

At that meeting the chairman was instructed to issue later a call for a general meeting to be held in Springfield, Mass., on May the fifteenth, 1867, to which all master car builders were invited. There was a large gathering; it adjourned to meet at Altoona, Pa., September 18, 1867. At this meeting a constitution and by-laws were adopted. This small beginning has grown to a membership of 447 and receipts amounting to \$17,610.95.

In December, 1876, a meeting was called by Leander Garey to meet at the Palmer House, Chicago, to prepare a code of rules governing the interchange of freight cars. That meeting was in session two days and was attended by superintendents and master car builders from quite a number of railways. The result of that meeting is now generally acknowledged; Leander Garey was president, and John Kirby secretary of the meeting.

On the first of October, 1865, the Red Line, a fast freight line, started; its limits were Boston, New York, Chicago. The quota of cars each nine organizations put into this line was one car to every three miles of road. To maintain the cars was a problem, as each company's cars differed in construction from any other company's cars. The next April a meeting of the master car builders was held in Buffalo to decide on some plan for taking care of that rolling stock.

It was decided that depots be established at New York, Boston, Albany, Buffalo, Toledo and Chicago for supplies of different parts that were most likely to give out. The present system is an improvement. At the time the line started the gage of track between Boston, New York and Buffalo was 4 ft. 8½ in.; from Buffalo to Erie, 83 miles, was 4 ft. 10 in.; from Erie to Cleveland, 4 ft. 9½ in.; from Cleveland to Toledo, 4 ft. 9 in.; from Toledo to Chicago, 4 ft. 8½ in. To run the cars over this variation of gages was accomplished by spreading to gage of wheels on the axles, widening the throat of guard rails and frogs and increasing the width of wheel tread one inch; that was the origin of "Broad Tread."

This will be more inspiring to young men than any words of mine:

Act now—don't wait for chance or fate  
To bring the prize;  
Seize now the rope, that's held my hope  
And realize.  
Climb high—don't stop, there's room on top,  
Where eagle's fly;  
Above the mass and doubting class  
Great honors lie.  
Don't cringe—don't flinch should fortune pinch,  
And all seem lost;  
with might and main,—try, try again,  
At any cost.  
Fight on; don't yield life's battle field,  
To friend or foe;  
Press to the front, receive the brunt,  
And strike the blow.  
Be brave, be true, in all you do,  
Hold honor high.  
Be sure you're right, then force the fight,  
And win or die.

F. W. Brazier (N. Y. C. & H. R.): I do not think a communication like that from the "Grand Old Man" of the M. C. B. Association should go by unnoticed. Mr. Kirby is, without doubt, anxious to resign his position. I believe, as he has tendered his resignation, we as a body should accept it and send him a vote of thanks for the long-continued service he has rendered to this Association, and tell him that his letter was an inspiration to us all.

C. A. Seley (C. R. I. & P.): I second the motion, and amend it to the effect that the vote shall be a rising vote. I think we should emphasize in every possible way our appreciation of the service which Mr. Kirby has rendered this Association.

The motion was unanimously carried by a rising vote.

The recommendation of the executive committee that the dues for the current year remain as at present, \$4 per vote, was approved.

L. E. Endsley, associate professor of Railway Mechanical Engineering of Purdue University, and E. A. Averill, managing editor of the *American Engineer and Railroad Journal*, were proposed as associate members.

C. A. Seley (C. R. I. & P.), E. W. Pratt (C. & N. W.), and T. H. Goodnow (L. S. & M. S.) were elected members of the auditing committee.

The committee on nominations made the following nominations: For president, T. H. Curtis, superintendent of machinery (L. & N.); A. Stewart, general superintendent motive power (Southern); D. F. Crawford, general superintendent motive power (Penn. Lines).

For vice president, the new constitution requires six members to be named; three are to be elected. The nominees are: T. H. Curtis, superintendent of machinery (L. & N.); A. Stewart, general superintendent motive power (Southern); D. F. Crawford, general superintendent motive power (Penn. Lines); C. E. Fuller, superintendent of motive power (Union Pacific); Henry Bartlett, general superintendent motive power (B. & M.), and E. D. Bronner, superintendent motive power (Michigan Central).

For treasurer: John Kirby, of Adrian, Mich; John S. Lentz, master car builder (Lehigh); J. W. Marden, S. C. D. (B. & M.).

For executive committee: J. D. Harris, general superintendent motive power (B. & O.); C. E. Fuller, superintendent motive power (Union Pacific); H. D. Taylor, superintendent motive power (P. & R.); J. S. Walsh, superintendent motive power (C. & O.); C. A. Seley, mechanical engineer (C. R. I. & P.), and R. D. Smith, assistant superintendent motive power (B. & A.).

The report was accepted and the president announced that the tellers would be named and the ballots distributed on Friday morning; the polls will close at 11.30 on that day, which will give the tellers time to count and report before final adjournment.

# REVISION OF STANDARDS AND RECOMMENDED PRACTICE.

1. The usual circular of inquiry was sent out and the replies thereto were carefully considered. In addition a number of subjects were submitted to the committee during the year, which are included in the report.

## STANDARDS.

### Journal Box and Details.

Pages 581 to 583, Sheets M. C. B. Nos. 1, 2, 4, 5, 7, 8, 10, 11, 13 and A.

2. The question has been raised as to the advisability of opening the bottom of the dust guard slide to facilitate the cleaning out of the core and applying the dust guard to the box. It is also claimed that there would be less breakage of dust guards in service. With the bottom of the box closed it fills up with dirt.

Referred to the Committee on Freight Car Trucks, for investigation and report to the 1911 convention.

3. A member calls attention to the drawing of the M. C. B. box; the wedge stop lug on box is of such height that when wedge is horizontal the height of bearing between wedge and front stop lug is but  $\frac{1}{4}$  inch. In practice it is found that this bearing surface is insufficient, tending to rapid wear, and when in this condition liability of wedge working out of place, resulting in breakage of the boxes. Fig. 1 shows a wedge and box on which the vertical height of this bearing surface is  $\frac{1}{2}$  inch; Fig. 2 shows a scheme for providing still more bearing surface; Fig. 3 details the M. C. B. conditions, giving but  $\frac{1}{4}$  inch depth of bearing surface, and Fig. 4 shows the M. C. B. wedge tilted as far as it can go without raising the box, in



R. L. Kleine.

which position there is no bearing surface whatever between lug and wedge. In view of this, it is recommended that the bearing surface of wedges be changed in accordance with Fig. 1.

Referred to the Committee on Freight Car Trucks.

### Journal Box and Details.

Pages 581 to 583, Sheets M. C. B. Nos. 3, 6, 9 and 12.

4. A member suggests that the front-end construction of the journal-bearing wedge be changed so as to provide a suitable opening through the top of the wedge, in which to engage a packing hook for the convenient removal of the wedge for rebrassing, and submits a suitable design to provide for this; the oblong hole being forward of the bearing surface of the wedge.

Referred to the Special Committee on Freight Car Trucks, with the approval of this committee.

### Journal Box and Details. For Journals $3\frac{3}{4}$ by 7 Inches.

Page 581, Sheets M. C. B. Nos. 1, 2 and 3.

6. A member calls attention to the last paragraph under this heading, reading as follows: "In 1908 a dimension of 3-16 inch was shown, it being the distance from the center line of bolt hole to inside bearing face of lid." Plate 3 shows

the dimension 3-16 inch, which was inserted in 1909, therefore Sheet 3 should have added below "Revised 1894, 1896, 1905," the date "1909."

The committee requests the Secretary to make the addition.

### Journal Box and Details. For Journal 5 by 9 Inches.

Pages 582 and 583, Sheets M. C. B. Nos. 7, 8 and 9.

10. A member suggests adding after the word "modified," in last paragraph, under this head, the following: "and words 'cast steel' were omitted from the drawing of the wedge."

The Secretary is requested to make the change.

### Journal Box and Details. For Journals $5\frac{1}{2}$ by 10 Inches.

Page 583, Sheets M. C. B. Nos. 10, 11 and 12.

11. A member suggests adding after last paragraph in text, under the heading, "In 1909 the word 'malleable' was stricken out and the words 'drop-forged' substituted for journal-bearing wedge."

The Secretary is requested to make the change.

### Standard Axles.

Pages 584 to 586, Sheet M. C. B. No. 15.

13. A communication referred to the committee recommends making the radii of the fillets at the back end of the journal, dust collar seat and wheel seat uniform for each individual type of axle, to avoid changing tools in turning up the fillets above referred to. Investigation develops that tools are not changed at the shops in turning up the axles, the same fillet being used for the journal, dust guard and wheel seat, and if the proper radius is adopted it will not affect the strength of the axles and make the standards consistent with practice.

The present and proposed standards are as follows:

Axle.		Journal Fillet.	Dust-guard Fillet.	Wheel-seat Fillet.
A. (40,000 lbs.)....	{ Present ....	$\frac{1}{4}$ inch	$\frac{1}{4}$ inch	$\frac{3}{4}$ inch
	{ Proposer ...	$\frac{1}{4}$ inch	$\frac{1}{4}$ inch	$\frac{3}{4}$ inch
B. (60,000 lbs.)....	{ Present ....	$\frac{5}{8}$ inch	$\frac{1}{4}$ inch	$\frac{3}{4}$ inch
	{ Proposed ...	$\frac{5}{8}$ inch	$\frac{5}{8}$ inch	$\frac{3}{4}$ inch
C. (80,000 lbs.)....	{ Present ....	$\frac{3}{4}$ inch	$\frac{1}{4}$ inch	$\frac{3}{4}$ inch
	{ Proposed ...	$\frac{3}{4}$ inch	$\frac{3}{4}$ inch	$\frac{3}{4}$ inch
D. (100,000 lbs.)...	{ Present ....	$\frac{3}{4}$ inch	$\frac{1}{4}$ inch	$\frac{3}{4}$ inch
	{ Proposed ...	$\frac{3}{4}$ inch	$\frac{3}{4}$ inch	$\frac{3}{4}$ inch

The reason for maintaining the fillet of the journal, as specially noted for the A and B axles, is that any change in the journal fillet will result in confusion in car brasses.

Committee, therefore, recommends that the journal, dust guard and wheel seat fillets be changed in accordance with the proposed standards as tabulated.

### Wheel Circumference Measure.

Page 586, Sheet M. C. B. No. 16.

14. The wheel circumference measure was omitted from the Standards in the rearrangement of the sheets last year, and the committee requests the Secretary to insert it.

### Gauges for Mounting and Method of Mounting Wheels.

Standards, page 588, and Recommended Practice, page 637; Sheet M. C. B. No. 16.

15. A member calls attention to the following: The gauges for mounting and inspecting wheels, as shown on Sheet M. C. B. No. 16, are not in accordance with the text on this subject and furthermore, these gauges for the uses as shown require revision. As they are now portrayed on this sheet they are not understood and, if followed, are not in accordance with proper practice for mounting and inspecting wheels. He suggests that the Standards and Recommended Practice should set forth an approved method for mounting wheels. This member submits corrections in gauges, revision and additions for mounting wheels and recommendations for turning axles, wheel seats, mating wheels and boring wheel fits; also mounting pressures at which wheels should be mounted.

The committee refers the subject to the Committee on Car Wheels, for their consideration and such corrections in gauges as may be found necessary. It is important that we should have some recognized standard for mounting of wheels, as well as the pressures at which they should be mounted.

### Brake Beams.

Pages 590 to 592 inclusive, Sheet M. C. B. No. 17.

16. A member suggests that the text under this heading should be revised and the details placed in chronological order.

The committee recommends that the text of the Standards and Recommended Practice be revised to show the action taken historically, under the different subjects, which will be found necessary as the revision is investigated. This to be

as brief as possible and at the same time cover the essential features.

#### *Air Brakes—General Arrangement and Details.*

Pages 592 and 593, Sheet M. C. B. No. 18.

18. A member suggests that, inasmuch as the piping layout shown on Sheet M. C. B. No. 18 was intended to apply to wooden cars only, which was approved by letter ballot in 1909, a committee be appointed to present the piping arrangement for steel cars.

As this matter is under the jurisdiction of the Standing Committee on Train Brake and Signal Equipment, the committee referred it to that committee.

19. A member calls attention to the present standards, which provide that the hand-brake chain is to be attached to brake mast by a  $\frac{1}{2}$ -inch machine bolt instead of an eye bolt, and recommends that a machine bolt as per print submitted be shown on Sheet M. C. B. No. 18 and referred to in Index, under the heading, "Standards of the Association." When the ordinary  $\frac{1}{2}$ -inch machine bolt is used serious failures occur, due to the heads of the bolts breaking off, therefore indicating that there should be a fillet between the shank of the bolt and head.

This is referred to the Committee on Train Brake and Signal Equipment, with the approval of this committee.

#### *Air Brake Repair Card.*

Pages 589 and 599.

20. A member suggests changing the heading in text, "Air Brake Repair Card," to read, "Air Brake Defect Card"; also change the place of application of the defect card from "as near to the car number as possible" to "To be wired to branch pipe as near triple valve as possible." Adopt standard colors and size for these air-brake defect and cut-out cards, showing an eyelet in the top of card so that it can be secured to branch pipe with wire—red color for defective air-brake card and manila color for air-brake cut-out card. The defects enumerated on these cards should be revised so that the defects shown on the defective air-brake card will be such that will not permit a car to be placed between air-brake cars, or, in other words, the following defects: Cut-out cock, angle cock, branch pipe between train line and cut-out cock, train pipe and hose and coupling. The defects on the air-brake cut-out card should only cover defects to the air-brake equipment which will permit the car to be placed between air-brake cars; in other words, a car having the following defects: Triple valve, reservoir, brake cylinder, cylinder packing leather, release cock, brake rigging, odd brake, branch pipe between triple valve and cut-out cock. Sample cards submitted. The new location is better in that it provides a uniform location for attaching these cards. The two colors distinguish the car which has a through train line with the brake cut-out from the car which has a train line in a defective condition.

Referred to the Committee on Train Brake and Signal Equipment.

#### *Safety Appliances—Freight Train Cars.*

Pages 602 to 606, Handholds.

21. A member calls attention to Sheet M. C. B. No. 19, revised 1900. Sheets 19-E, 19-F, 19-G, 19-H, 19-I and 19-J were revised, account of eliminating reference to wooden tread  $1\frac{1}{2}$  by 2 inches. Cause of revision should be inserted in the notes, under heading "Safety Appliances."

Secretary requested to make the proper reference in text, under the heading "Handholds."

#### *Automatic Coupler.*

Page 609, Sheet M. C. B. No. 23.

22. A number of members recommend the addition of the  $8\frac{1}{2}$ -inch butt to the standards, for the following reasons: The  $6\frac{1}{2}$ -inch coupler butt was originally designed to use with the  $6\frac{1}{4}$  by 8-inch draft spring and allows  $\frac{1}{4}$ -inch clearance. The  $9\frac{1}{2}$ -inch butt was designed to take certain friction gears requiring that width within the yoke. For several years past, the M. C. B. class "G" spring, or springs of that dimension, have been used on many thousand cars, but the  $6\frac{1}{2}$ -inch butt is not of sufficient depth, and it is not deemed good practice to use liners between the butt and yoke ends. The diameter of a class "G" spring is 8 inches, and if used with a  $9\frac{1}{2}$ -inch butt the clearance is too great and the springs are not central;  $8\frac{1}{2}$ -inch coupler butts are now being furnished for use with the class "G" spring and many thousands are in service.

Referred to the Standing Committee on Couplers and Draft Equipment, with the recommendation that a suitable  $8\frac{1}{2}$ -inch butt be designed for use with the class "G" type of draft spring.

23. A member suggests enlarging the slot in the M. C. B. coupler to  $1\frac{1}{4}$  by  $5\frac{1}{8}$  inches, to accommodate draft key  $1\frac{1}{8}$  by 5 inches, for both sizes of shank. In addition to increasing the size of slot, it is also recommended to provide additional bearing surface for the key.

Referred to the Committee on Coupler and Draft Equipment.

24. A member calls attention to Sheet M. C. B. No. 23, rearranged in 1909, on account of showing 3-16-inch radius on corner of coupler butt. Reference to this revision should be made in the text, under heading "Automatic Coupler."

Committee requests the Secretary to add reference to text.

25. A member suggests that the text under this heading should be revised and the details placed in chronological order. That the specifications on page 611, reading as follows: "That all couplers must have an eyelet for locking device located immediately above locking pin hole," be changed to read, "That all couplers must have a 1-16-inch eyelet," etc., to conform to note on Sheet M. C. B. No. 23.

Committee requests the Secretary to add to text, "That all couplers must have a 1-16-inch eyelet," etc.

#### *Specifications for M. C. B. Automatic Couplers.*

Pages 612 to 621.

26. A member suggests including under Article 4, page 613, second paragraph, "The lift of the locking pin must not be more than 6 inches." This is now included in the standards, but should also be placed in the specifications.

Secretary requested to add to specifications, "Lift of locking pin must not be more than 6 inches."

#### *Siding, Roofing and Lining.*

Page 622.

27. A member suggests that reference to flooring under this heading should be removed and placed under the heading "Flooring," on same page, where it properly belongs.

Secretary is requested to make the change.

#### *RECOMMENDED PRACTICE.*

##### *Limit Gauges for Inspecting Secondhand Wheels for Remounting.*

Page 637, Sheet M. C. B.—B.

30. A member suggests to advance the Recommended Practice, "In 1907 limit gauges for use at shops when inspecting secondhand wheels for remounting were adopted as Recommended Practice," to Standard, in order that this gauge may be generally used and to prevent badly worn wheels from being remounted.

Committee approves this recommendation.

##### *Wheel Tread and Flange for Steel and Steel-tired Wheels.*

Page 638, Sheet M. C. B.—G.

31. A member suggests the following: While text or sheet does not specify that steel or steel-tired wheels, for freight cars, must be 33 inches in diameter when new, it is assumed that the diameter new is to be in accordance with the Recommended Practice for cast-iron wheels.

That this question be referred to the Committee on Car Wheels, with instructions to look into the question of proper diameter for such wheels in so far as maintaining the proper height of couplers for steel freight cars, also in maintaining effective brakes when wheels are worn to the limit, as trouble is experienced in holding couplers on steel cars within the limits, also as the brake details are now such that an effective brake can not be maintained.

Referred jointly to the Committee on Train Brake and Signal Equipment and to the Committee on Car Wheels.

32. A member calls attention to Sheet M. C. B.—G. Worn steel tire shown at the bottom of left-hand corner of the sheet is incorrect, as the thickness through throat is  $1\frac{1}{8}$  inches or more, instead of 1 inch, as shown.

Referred to the Committee on Car Wheels, with the suggestion that this cut be eliminated, as the subject is covered by the four cuts shown above the old cut referred to.

#### *Brake Beams.*

Page 638.

33. A member suggests advancing to Standard the following Recommended Practice, under the head of "Brake Beams": "The brake hangers shall have an angle as nearly as possible to ninety degrees from a line drawn from the center of the brake shoe to the center of the axle when the shoes are half worn."

Referred to the Committee on Train Brake and Signal Equipment, with the request that they investigate the ques-

tion of angularity of brake hangers before any action is taken to advance to Standard.

34. A member suggests advancing to Standard the following Recommended Practice, under the head of "Brake Beams": "That brake beam hanger brackets shall be attached to some rigid portion of the truck."

Committee approves this suggestion.

#### Carrier Iron.

Page 639.

35. A member suggests to advance to Standard the following Recommended Practice, under the head "Carrier Iron," and change title to read: "Brake Staff Carrier Iron": "In 1908 a Recommended Practice was adopted to use a 'U'-shaped carrier iron for brake shaft bow for new cars, so that the half yoke now largely used would not be extended to new cars."

Committee concurs in this recommendation.

#### Cleaning Air Brakes.

Page 644.

36. A member makes the following recommendation: Last year it was suggested that the Recommended Practice covering "Cleaning Air Brakes" and diagram of triple valve test rack modified to care for testing of "K" and other late types of triples be advanced to Standard, which suggestion was referred to the Committee on Train Brake and Signal Equipment, but no report. As this is an important matter the recommendation is renewed.

Referred to the Committee on Train Brake and Signal Equipment.

#### Steam and Air Line Connections.

Page 649, Sheet M. C. B.—Q.

37. The report of Committee on Air Brake Hose to the 1909 convention, with particular reference to "standard dimensions of air-brake hose couplings and gaskets," was received and referred to the Committee on Standards for further investigation and report. Inasmuch as this involved the design of the air-brake hose coupling, gasket and gauges for both new and worn air-brake hose couplings, and should possibly be extended to signal hose couplings, the committee felt that this matter should have been referred to the Standing Committee on Train Brake and Signal Equipment, who have direct jurisdiction over the designing and interchangeability of these parts, and accordingly referred this subject to the Committee on Train Brake and Signal Equipment by letter, dated August 10, 1909, through the Secretary of the Association, who advised, under date of August 13, 1909, that the matter had been so referred.

#### Coupler Yokes.

Pages 650 and 651, Sheet M. C. B.—C.

39. A member calls attention to Sheet M. C. B.—C, rearranged 1909. The radius of  $\frac{1}{8}$  inch was added to inside of yoke lip. Mention should be made in the text.

Secretary requested to make the following reference: "In 1909 a  $\frac{1}{8}$ -inch radius was added to inside of yoke lip."

#### Knuckle-throwing Device.

Page 651.

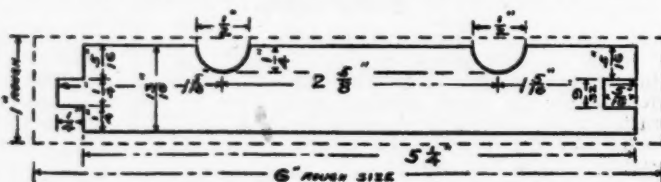
40. A member suggests to advance to Standard the following Recommended Practice for couplers applied after September 1, 1911: "In 1905, as a result of letter ballot, the following Recommended Practice was adopted: 'That the use of a knuckle-throwing device which will throw the knuckle completely open and operate under all conditions of wear is favored by the Association.'"

Committee concurs in this recommendation.

#### Rounding Corners of Doors, Door Jambs and All Other Inside Exposed Corners of Stock Cars, to Prevent Injury to Cattle.

Page 653, Sheet M. C. B.—F.

42. Under date of May 12, 1909, the Pennsylvania Society for the Prevention of Cruelty to Animals brought to the attention of the Master Car Builders' Association that cattle, loaded and unloaded in stock cars with sharp cornered door and door jambs, were being injured by barking their shoulders



Corner of Doors and Door Jambs Rounded.

ers and hips on these sharp corners, and suggested that the same be rounded. The committee submits the following for Recommended Practice:

Doors, door jambs and all other inside exposed corners of stock cars to be rounded to prevent injury to cattle. Add cut to sheet M. C. B.—F. showing the same. See illustration.

#### Limit Gauges for Round Iron.

Page 665.

43. The Secretary forwarded to the committee a communication received from one of the manufacturers of bar steel that the allowable variations provided by the limit gauges for bars  $1\frac{1}{8}$  inches,  $1\frac{1}{2}$  inches and  $1\frac{3}{4}$  inches in diameter are rather close for regular mill practice, and can only be met under special conditions and with special care, which commands a special price. They further advise that the standard rolling mill practice for bars 1 5-16 inches in diameter up to 2 inches, inclusive, is .0156 inch variation either way, i. e., above or below the nominal diameter, whereas the present Recommended Practice for round iron within these sizes is as follows:

Nominal Diameter of Iron, Inches.	Large Size + End, Inches.	Small Size — End, Inches.	Total Variation, Inches.
$1\frac{1}{8}$ .....	1.2605	1.2395	.021
$1\frac{1}{2}$ .....	1.3860	1.3640	.022
$1\frac{3}{4}$ .....	1.5110	1.4890	.022
$1\frac{7}{8}$ .....	1.6140	1.636	.022

Limit gauges for round iron for sizes varying from  $\frac{1}{4}$  inch up to and including  $1\frac{1}{4}$  inch were adopted in 1883. In 1907 the Standing Committee on M. C. B. Couplers recommended limiting diameters for round iron  $1\frac{1}{8}$ -inch,  $1\frac{1}{2}$ -inch and  $1\frac{3}{4}$ -inch, which were adopted by letter ballot, so as to include sizes for  $1\frac{1}{8}$ -inch knuckle pivot pin steel. In 1909 the Coupler Committee recommended an allowable variation of 1-64 inch above and below the nominal size ( $1\frac{1}{8}$ -inch) for knuckle pivot pins, stating that it was difficult to procure steel within the limits of .011 inch above and below the nominal diameter as provided for by the present limit gauges; this recommendation was approved by letter ballot.

Committee recommends the appointment of a special committee to determine whether any changes in the present limits are necessary and desirable, and, if so, to fix new limits. This matter requires investigation before establishing any new limits, on account of the effect increased limits would have upon the standard screw threads used.

#### Splicing of Steel Center Sills.

Page 666, Sheet M. C. B.—D.

44. A member calls attention to Sheet M. C. B.—D, rearranged in 1909, account of showing end sills on spliced steel sills. Reference should be made in the text calling attention to this revision.

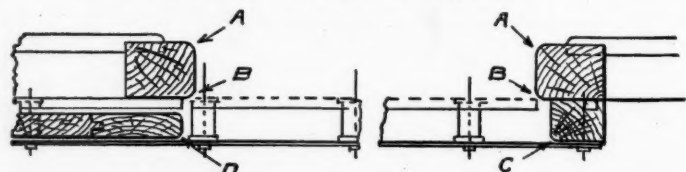
Committee requests the Secretary to make the following addition to text: "In 1909 cuts were revised by the addition of end sills to drawing."

#### Fluted Car Roofing.

Page 667, Sheet M. C. B.—K (suggested).

45. At the last convention the committee recommended the appointment of a special committee to investigate and submit plans for fluted car roofing. The Executive Committee thought that this could best be handled by the Committee on Standards, and therefore referred it back to your committee for investigation and report. Accordingly, a circular of inquiry was sent out to the members. A majority of the replies received indicated that fluted car roofing was desirable for double board roofs. The designs of fluted roofing submitted were carefully considered and your committee would recommend the following for Recommended Practice:

Fluted roofing for double board roofs shall be of the section as shown on Sheet M. C. B.—K. See cut.



CORNERS MARKED A. B. C.  $\frac{1}{2}$ " RAD

" " " D  $\frac{1}{4}$ "

"Fluted Roofing."

The report is signed by: R. L. Kleine (P. R. R.), chairman, Jno. Hair (B. & O. S. W.), T. M. Ramsdell (C. & O.), W. E. Dunham (C. & N. W.), and T. H. Goodnow (L. S. & M. S.).

## DISCUSSION OF REPORT ON STANDARDS AND RECOMMENDED PRACTICE.

Mr. Kleine: I might say that in the cut of the fluted roofing the dimension line which goes to the tension, should stop at the root of the tension, so as to make the distance from centre to centre of groove,  $2\frac{3}{4}$  in.

C. M. Bloxham (U. T. L.): Referring to paragraph 22. The  $6\frac{1}{2}$  in. coupler butt gives one-quarter inch clearance when used with the  $6\frac{1}{4}$  in. butt, and with the new proposed  $8\frac{1}{2}$  in. coupler butts, gives  $\frac{1}{2}$  in. clearance, when used with an 8 in. spring. Why is the additional  $\frac{1}{4}$  in. clearance necessary on the 8 in. spring over the  $6\frac{1}{4}$  in. spring.

Mr. Kleine: I might say that the committee accepted the recommendations of the various members who are now using the 8 in. spring. They are now using the  $8\frac{1}{2}$  in. coupler butt with the 8 in. spring.

C. A. Seley (C. R. I. & P.): I was connected with the request of this  $8\frac{1}{2}$  in. coupler butt, and would say that it has reference not only to the capacity of the 8 in. spring, but to various types of friction gears. Just why the one-quarter inch was added, originally, I do not know, but the fact remains that a large number of  $8\frac{1}{2}$  in. butts are in use with G springs and various types of friction gear, and rather than make another size, for a variation of  $\frac{1}{4}$  in., making an 8 in. butt, it was desirable to make it  $8\frac{1}{2}$  in.

C. A. Schroyer (C. & N. W.): Personally, I am opposed to the adoption of another standard coupler, with a different sized butt. If this is done, it necessitates the carrying of an additional coupler in stock to meet the requirements of repairs.

Mr. Kleine: The committee on standards referred this matter to the committee on couplers for their approval, because of the large number of communications received from the different roads as to the necessity for the  $8\frac{1}{2}$  in. butt, and the fact that when the  $9\frac{1}{8}$  in. butt is used with the 8 in. draft spring, it puts the spring out of alignment.

J. H. Manning (D. & H.): I would like to hear a discussion on the question of using a  $9\frac{1}{8}$  in. tail with the 8 in. spring, by tapering it up from the back. There are a great number of cars in service that way now, and it is apparent that the  $9\frac{1}{8}$  in. tail can be used for the friction gear as well as the 8 in. G spring. As far as the alignment is concerned, I do not think there will be any trouble with that. We will then have only two couplers.

C. A. Schroyer: If we are to adopt a roof board according to the drawings shown in the report, we will be laughed at by everybody, because there is nothing about that roof board that is correct, and, anyhow, the time for the use of the roof board is very nearly gone. We have for forty years gone on covering our cars with matched and grooved flat roof boards, and now that we are about to abandon that practice, we are presented with a proposed standard for adoption which is not right. That drawing is not right. No one works out roof boards like that.

O. C. Cromwell (B. & O.): Paragraph 30 shows the "Limit Gauges for Inspecting Secondhand Wheels for Remounting," and the committee recommends that this be advanced for adoption as a standard. This is one of the questions which can be well left to the practice of the railway companies individually, and we should be careful not to tie ourselves down to too many standards. I do not see any particular necessity for it in connection with the interchange business.

J. J. Hennessey (C. M. & St. P.): The association should be very careful not to adopt too many standards. The wooden roof is going out gradually, and at times you cannot get lumber that you can make a  $5\frac{1}{4}$  in. width board, although you pay for it; by the time the wood is seasoned, you cannot make the roof board over 5 in. At other times, it is greatly to the advantage of the railway to put on 4 in. roof boards, particularly on the outside of metal roofs. Many roads find it good practice to do away with the grooves entirely on the inside metal roofs, where the boards are put on for protection to the metal. We have come to a point where the double board roof is almost a thing of the past, and I do not believe it is even wise to submit that proposed standard to letter ballot, but that the railways should be left to their own practices in this regard. It is something which has nothing to do with the interchange of cars; it does not tie up traffic, and it may, under some conditions. The  $5\frac{1}{4}$  in. widths cannot always be obtained, but we are constantly asked to allow the use of 4 in. width, which works down to  $3\frac{1}{2}$  in., and it makes as good a roofing as the wider roofing, the only objection being that it does not fit in where a given number of  $5\frac{1}{4}$  in. boards are taken out. In view of the fact that the coming roof is to be a metal roof, either inside or outside, the necessity for the adoption of a thing of this kind is passed, and I want to make a motion, in so far as the recommendations relative to the roof board are concerned, that they be eliminated.

A motion was carried that the reference to the roof boards in the report be eliminated.

Mr. Kleine: We had a request from those who use the fluted or double roof board, who wanted to have a standard as to the best method of applying it, and the committee sent out a circular; we had nine replies, eight of which favored the fluted roofing. Under these conditions, what could the committee do but present a recommendation covering a fluted roof board?

Mr. Kleine: Replying to Mr. Cromwell's remarks with reference to paragraph No. 30, which covers the limit gauges for inspecting secondhand wheels for mounting. It is a question that has not received sufficient consideration. We have nothing to show now what is a good secondhand wheel—we have prices given in the Interchange Rules for secondhand wheels, and we should have something to show what is good practice in the remounting secondhand wheels and placing them under foreign cars, that is, the limits in regard to flange thickness.

W. E. Fowler: That subject was discussed by the Wheel Committee, and we came to the conclusion that it was a measure of protection that this Association owed to each of its members to see that when members were called upon to pay for secondhand wheels, they should know they were getting something under their cars that was somewhat serviceable.

C. E. Fuller (U. P.): I want to strongly advocate keeping the rule in. It is one of the best rules that has been offered, and I believe we would be making a mistake to attempt to cut it out.

A motion that paragraph 30 be eliminated from the report was lost.

The report of the committee, as amended, was then accepted.

F. W. Brazier: It is apparent that if we had not changed our constitution we could proceed at this time and finish all of the business laid out for today's two programmes, and be able to adjourn at half past one; but, according to the constitution, we must give one day's notice, and I move that our meeting tomorrow morning be from ten o'clock until the time of adjournment, unless the business should warrant an afternoon session.

The motion was carried.

In the absence of A. J. Cota, chairman of the Committee on Train Brake and Signal Equipment, E. W. Pratt (C. & N. W.), presented the report.

## Train Brake and Signal Equipment.

## 1.—Lake Shore Emergency Brake Tests.

Following is a report covering a historical statement of events which led up to the emergency brake tests, conducted by the Lake Shore & Michigan Southern Railway, and finally the results obtained from the tests, which are herewith presented to those interested in the problem of stopping heavy passenger trains at high speeds.

Representatives from several railroad companies having under construction heavy steel passenger equipment cars proposed to the Executive Committee of this Association, dur-



A. J. Cota.

ing the convention last year, a subject requiring the immediate consideration, namely, "The definition of proper air-

brake equipment for passenger cars weighing 130,000 pounds or over."

The committee on Train Brakes and Signal Equipment was accordingly summoned to attend a joint meeting of the committee and representatives from various railroad companies and manufacturers directly interested in the subject, at the Union Station, Pittsburg, July 1, 1909. A. W. Gibbs, G. S. M. P. (P. R. R.), was elected chairman of the meeting. The object of the meeting was, on the request of the chairman explained by A. L. Humphrey, in effect that some hundreds of passenger cars contracted for early delivery would be of such weight as to have practically outgrown the foundation brake rigging of to-day, and a radically new design was imperative. However, it would be too late for consideration after the next Master Car Builders' convention. The heavy cars contracted for would soon be delivered and brake designs must be decided upon at once. It was further brought out that until five years ago the maximum weight of cars approximated 90,000 to 110,000 pounds, and with such cars it was found necessary to employ 16-in. or 18-in. brake cylinders. The leverage ratio used was as high as 9 to 1, which is the recognized maximum ratio of leverage permissible; the 18-in. cylinder would provide for cars of maximum weight up to 127,000 pounds. For cars above this weight it will be necessary to increase either the leverage ratio or the cylinder power. Cars now under construction will weigh from 140,000 to 150,000 pounds and even more, which makes it necessary to redesign foundation brake rigging so as to provide a suitable brake.

Manufacturers could probably meet the conditions by employing a 20-in. brake cylinder. This, however, is very objectionable from many standpoints. It would involve the question of clearance space underneath the car, severe horizontal stresses in car body members, increased cylinder leakage, it being quite impossible to obtain packing leathers of sufficient uniformity to prevent excessive leakage, and the pistons, rods and levers would become so heavy that it would require some fifteen or twenty per cent of the brake power to move them. It was felt, therefore, that the 20-in. brake cylinder is impracticable.

If not a 20-in. cylinder, it would necessarily call for two cylinders of an approximate equal area, say two 14-in. cylinders, one on each end of the car. This would mean a complication in the way of double equipments, which should receive careful consideration on the part of the Master Car Builders' committee and railroad representatives present. It would also be quite difficult to operate the two equipments with one triple valve.

Another proposition would be to place the entire apparatus on the trucks, using either a single or two cylinders of equal area, which method is considered desirable, would require a flexible connection between the brake pipe and the cylinders.

Another method would be to use the clasp brake, requiring two brake beams or four shoes to each pair of wheels. There are, however, many objections to this design, and it is questionable whether the acknowledged theoretical advantages of the clasp brake would be considered practicable.

Another scheme would be to permit an increase of piston travel by lengthening the brake cylinder. This is also objectionable on account of the undesirable angularity of levers thus involved.

The matter can, therefore, be resolved into five propositions, as follows:

1. A 20-in. diameter brake cylinder, with increased packing leakage.
2. Two brake cylinders per car, which would probably make it necessary to provide two complete brake equipments, including triple valves, etc., whether applied to the car body or trucks.
3. Clasp brakes, meaning the application of two brake shoes per wheel, one on either side. This method would probably provide ample braking power for a 150,000-pound car, using an 18-in. diameter brake cylinder, with a leverage ratio of 9 to 1.
4. Increased length of an 18-in. brake cylinder, and consequent longer piston travel, with an increased leverage ratio and objectionable angularity of levers.
5. Two brake cylinders of equivalent area to one 14-in. cylinder applied to each truck.

The brake apparatus has not kept pace with the increased weights and speed of the modern passenger train. Contributing factors which make necessary a different treatment in the application of braking or retarding force than that heretofore practiced are, briefly:

1. Increased unbraked locomotive weight.
2. Increased train momentum.
3. Increased brake rigging deflection and false motion, due to severe stresses in car members and other causes, which greatly increase the piston travel.

4. Increased brake leverage ratio, with consequent increased piston travel and lower maximum cylinder pressure.

5. Increased time to obtain brake effectiveness, on account of large cylinder volumes.

6. Decreased brake shoe coefficient of friction, due to greater brake shoe pressures and speeds.

7. Possible breaking down of the brake shoe under the severe conditions imposed.

It was the sense of the meeting that the problem should at once be considered from both a practicable and theoretical standpoint, and accordingly a subcommittee, composed of A. J. Cota, T. L. Burton and D. F. Crawford, was appointed, to determine the scope of and establish a basis for the investigation. The following resolutions, as submitted by this committee, were unanimously adopted by vote of the railroad representatives present:

"Resolved, That it is the sense of this meeting that the air brakes provided for the heavier passenger cars now building shall be of such design, proportion and capacity as to enable trains of the said heavier passenger cars to be stopped in practically the same distance after the brakes are applied as is now the case with existing lighter cars; and be it further

"Resolved, That for the use of this committee and others interested in making calculations, we suggest that it be assumed that the theoretically desirable stop is one which requires the space of not over 1,200 feet after the brakes are applied, the speed of the trains at the time of the application of the brakes being sixty miles per hour."

Another subcommittee was then appointed, composed of W. F. Keisel, Jr., R. B. Kendig, C. S. Knapp, W. V. Turner and F. W. Sargent, to recommend the maximum load per brake shoe, from which figure would be calculated the percentage of retardation necessary and also to make recommendations as to the number of shoes per car for different weight of cars. The subcommittee was continued for a meeting of the representative committee, to be held July 13, at which time they were to report on the following questions:

1. Allowable pressures per shoe.
2. Arrangement of cylinders and number of shoes for eight-wheel cars weighing 90,000 pounds and over.
3. Arrangement of cylinders and number of shoes for twelve-wheel cars weighing 120,000 pounds and over.
4. Recommendations as to limit of capacity and deflection of brake beams where used on above cars.
5. Recommendations as to arrangement of hand brakes.

A brief synopsis of their report follows:

1. F. W. Sargent, chief engineer of the American Brake Shoe & Foundry Company, assisted by R. C. Augur, then of the Westinghouse Air Brake Company, made a number of tests at the former company's laboratory, Mahwah, N. J., for the purpose of determining the mean coefficient of friction between wheel and shoe with M. C. B. standard dimensions for plain and chilled cast-iron shoes. The results of the tests indicated that the mean coefficient of friction as high as 10 per cent could probably be realized in service. Based on these tests, it was the opinion of the committee that the maximum pressure per shoe, the coefficient of friction in some cases pounds per square inch, and that in no case should these pressures be exceeded. It was further noted from Mr. Sargent's tests that with plain cast-iron shoes and 18,000 pounds pressure per shoe, the coefficient of friction in some cases fell as low as 8.4 per cent. This low coefficient of friction, however, was obtained with new shoes before the hard skin had been worn off; after the hard skin had been eliminated and a good bearing secured the coefficient increased above 10 per cent, in some instances running as high as 13.2 per cent. It, therefore, seemed entirely fair to the committee to base the calculations on an average mean coefficient of friction of 10 per cent, which was the figure decided upon.

2. It was agreed that the stop distance should be measured from the point where brake application is made, and that allowance would, therefore, have to be made in the calculations by deduction from the length of stop for the lapsed time before the brake became effective, estimated at two seconds, or a traveled distance of 176 feet, at the initial speed of sixty miles per hour.

3. In order to determine a basis on which to consider the brake power of the cars themselves, an ideal train, consisting of one locomotive and six cars was selected. It was agreed that the total weight of cars in the ideal train should be considered as being twice the weight of locomotive and tender. In other words, the weight of locomotive and tender should be one-third the weight of the entire train. Previous tests seemed to indicate that the effectiveness of the brake on locomotive and tender is decidedly less than on cars. In some previous tests, when the engine was disconnected immediately before brake application, the distance in which the loco-

tive came to a stop was nearly twice the distance in which cars stopped. It was decided, therefore, to class the effectiveness of locomotive and tender brake at one-half that of the cars. Taking the car effectiveness at 100 per cent and the locomotive at 50 per cent, and assuming the train composed of three unit weights, the brake effect of the ideal train would be in the ratio of 250 to 300, or as 5 to 6, as compared with the 100 per cent effectiveness of the cars. It was assumed, therefore, that a greater car retarding force would be necessary in the proportion of 6 to 5 than that necessary to stop the cars alone in that distance.

4. A further increase in the retarding factor for the cars is required to compensate for the load on cars, which was estimated at 7 per cent of the light weight of train. It was thought advisable to apportion this load over the train as follows:

- Sleeping cars, 3 per cent of light weight of cars.
- Coaches, 10 per cent of light weight of cars.
- Load cars, 15 per cent of light weight of cars.

5. With the foregoing data and assumptions determined, the required retarding force in terms of weight of car could be found as follows:

$F$  = retarding force.  
 $s$  = desired length of stop in feet.  
 $w$  = weight of car.  
 $V$  = velocity in feet per second.

$$(1) S = \frac{5(s-2V)}{6} = \text{compensated length of stop in feet, allowing for elapsed time to brake effectiveness, and also for the effect of the unbraked weight of locomotive.}$$

$l$  = lading allowance to be added to  $w$ ,  
 .03w for sleeping cars,  
 .10w for coaches,  
 .15w for load cars.

$$(2) w = w + l, \quad g = \text{acceleration of gravity} = 32.2.$$

Then for the work to be done,

$$(3) FS = \text{work} = \frac{1}{2} BV^2, \text{ and where } M = \frac{W}{g}$$

$$(4) F = \frac{W V^2}{2 g S}$$

6. The coefficient of friction of the brake shoe against the wheel was decided as 10 per cent. The efficiency of the brake rigging was assumed from previous tests to be 85 per cent. For cars equipped with brake beams the ratio of maximum cylinder pressure to maximum shoe pressure should not exceed 9; for cars without brake beams this ratio should not exceed 9.63. The maximum shoe pressure to be 18,000 pounds, as previously stated. Based on these figures, the maximum car weight for single shoe per wheel could be determined from the formula. If brake beam release springs or other devices materially affecting the efficiency of the brake gear are used suitable allowance should be made.

7. It was recommended that brake beams used on these cars should not deflect more than 1-16 in. under maximum emergency brake load, and that such brake beam should not take a permanent set under a load of 50 per cent in excess of the emergency brake load.

8. It was recommended that the hand brakes should be so connected that neither the cylinder nor hand-brake rod should act as a fulcrum for the other; also that the slack adjuster should be so located that it adjusts both air brake and hand-brake equally; that there should be room for at least 30 in., preferably 36 in., of chain on each shaft or worm of the winding apparatus, with 3,000 pounds pull on the hand-brake rod; that a release spring should be attached to the hand-brake lever to release the hand-brake and prevent excessive sagging of the chain; that cars which are equipped with two cylinders have the hand-brakes at the two ends of car arranged to operate independently of each other, and that each should apply the brake on one truck only. With two cylinders per car, both cylinders should be attached to car body.

9. As there seemed to be a possibility of pushing the axle out of its bearing, on account of high brake power, this question was taken into consideration. The committee recommended that the resultant of static load and brake-shoe pressure on the axle be determined, and that the direction of this resultant be kept inside of a line through the center of the axle and edge of bearing to an amount equal to 10 degrees. Other forces also act at this point, such as brake hanger effect on truck frame and friction between journal and bearing. If careful estimate of direction of resultants, based on all forces acting on the journal, is made, it would seem sufficient to have the direction of this resultant, when passing through center of axle, 5 degrees inside of the line through center of axle and edge of bearing. The direction of the resultant may be varied by lowering the brake shoe. It was further considered that, on account of the high brake

effect on passenger cars, the strain on the axle would be greater than on the same axle in freight service. The minimum resultant of static load and brake pressure in freight cars had been estimated at 125 per cent of static load. For passenger cars the minimum resultant was estimated at 187.5 per cent of static load, or 50 per cent greater than in freight service. Passenger cars, however, have a lower center of gravity than that of freight cars which has a tendency to reduce the strain per journal. Axles are also less subject to shock in passenger service than in freight service, for which reason it did not seem necessary to make an allowance commensurate with this condition. This indicated that it was not advisable to make an arbitrary reduction in axle capacity under static load for passenger service without a more careful investigation than possible in the limited time at command. Since the axle capacity is not a function of the brake designs, this subject can be held in abeyance until the various railroads can look into the question fully and give their recommendations.

Discussion following the reading of report resulted in a consensus of opinion that before acceptance of the recommendations offered a demonstration should be made by actual road tests with trains such as considered, during which tests records should be taken of all items of interest and particularly those representing the basis for calculating lengths of stop. Mr. Crawford assured the meeting that this feature would receive his personal attention and that arrangements would be made to conduct the tests on the Pennsylvania Lines at a time and place dependent upon the many conditions necessary to be taken into consideration.

In the meantime, on the return of the Lake Shore & Michigan Southern officials from the meeting, they took up with their management the question of trying out by actual road demonstrations the recommendations of the committee as applied to the type of cars under construction for them. Accordingly, some of the newly built, heavy, twelve-wheel passenger cars being delivered to that company by the manufacturers were made available for a ten-car test train before turning them into service. The test was arranged to take place in September or early in October. Mr. Gibbs intimated to the Lake Shore officials that, in addition to the heavy twelve-wheel coaches proposed for test, it might be desirable to make some trials with heavy steel eight-wheel coaches for comparison, and that they had available some cars of this type, which were offered for test if agreeable. The offer was accepted and a program was arranged for the test. On request of Mr. Parish, superintendent motive power of the Lake Shore & Michigan Southern, Mr. Gibbs, the chairman of the previous general meetings, called a meeting at Cleveland, on October 12, to discuss and criticize the proposed program of tests.

The program decided upon for the trials contemplated the following comparisons:

#### 1ST.—TRAIN

- a. Two locomotives and ten twelve-wheel cars.
- b. One locomotive and ten twelve-wheel cars.
- c. Two locomotives and six twelve-wheel cars.
- d. One locomotive and six twelve-wheel cars.
- e. One locomotive and six eight-wheel cars.

Dynamometer car to be used in several runs to measure the unbraked locomotive effect.

#### 2D.—SPEEDS.

- a. Sixty miles per hour.
- b. Eighty miles per hour.

#### 3D.—BRAKE EQUIPMENT.

##### Twelve-wheel Cars.

- a. High-speed brake, 90 per cent of weight of car, based on 60 pounds cylinder pressure. With maximum cylinder pressure, 85 pounds, equals 127.5 per cent.
- b. Retarding percentages as recommended by committee, with cylinder pressure 105 pounds. Note that, as explained in committee's report, this force varies for different classes of cars.

##### Eight-wheel Cars.

- c. High-speed brake, 80 per cent of weight of car, based on 60 pounds cylinder pressure. With maximum, 85 pounds cylinder pressure, equals 113.3 per cent.
- d. The same brake leverage at 105 pounds cylinder pressure, which is equivalent to 140 per cent braking power.

#### 4TH.—BRAKE SHOES.

- a. Chilled cast-iron shoes.
- b. Plain cast-iron shoes.
- c. Experimental, or even proprietary brake shoes, if necessary, on account of the possible breaking down of the cast-iron shoes under the enormous test pressures proposed.

It was realized by the Lake Shore officials that in carrying out such an elaborate program a large testing force would be

necessary, and on account of the many observations of a technical nature to be recorded, some assistance would be required from the other railroads interested if the tests were to be made as complete as outlined. This matter was brought before the general committee, with the result that volunteer observers were offered by and accepted from the following roads: Pennsylvania, Baltimore & Ohio, Chicago & North Western, Chicago, Burlington & Quincy, Central Railway of New Jersey, Northern Pacific, and New York Central Lines. The volunteer service made up approximately 50 per cent of the test crew, the balance being drawn from the Lake Shore & Michigan Southern. The Westinghouse Air Brake Company also offered observers, who were accepted, together with the use of chronograph station outfit, telephones and the recording apparatus with which the track and trains were equipped. The American Brake Shoe & Foundry Company offered to furnish the necessary brake shoes required for the tests, which offer was also accepted.

The brake shoes requested for test were as follows:

1. Plain cast-iron, to P. R. R. specification.
2. Chilled end cast iron, commonly known as the "U" shoe, as used on the New York Central Lines.
3. Chilled inset cast-iron, Streeter type, as commonly used on a number of roads.
4. Composite steel and cast iron, commonly known as Diamond S, also used by a number of railroads.

The above types of brake shoes were considered as fairly representing the types commonly used in passenger service throughout the country. In addition, the brake shoe company was requested to furnish another type, if possible, having a greater mean coefficient of friction, considering the service, than those mentioned above; this type was not named, and will be classed simply as "Experimental."

A stretch of ground, with stopping ground, two miles west of Milbury Junction, on the main line of the Lake Shore & Michigan Southern, was selected for the test. This selection was made with the idea of obtaining a perfectly level stopping ground at a point on the road where the passenger train schedule permitted the use of a high-speed testing track for considerable time during the day, without interfering with the regular passenger traffic. There are four tracks between Milbury and Toledo, which permitted the freight movement, uninterrupted, on the outside tracks.

An old box-car body was set off at the stopping ground and fitted up as a cabin, in which were installed the chronograph outfit for recording the successive speeds of train during the stop, telegraph instruments for following the movement of the test train, telephone for communication along the test ground, and drawing-tables, at which were worked up daily, for distribution to members of the crew and visitors, a complete log, showing the results of the runs made the previous day.

Circuit-breakers arranged to record the movement of the test train were located along the track at equal intervals in electric communication with the chronograph. This enabled the speed of train over each 100-foot interval, after passing the trip, to be recorded. The trip consisted of a wedge-shaped obstruction outside the rail, which engaged a mechanism on the locomotive operating a cut-out cock, which in turn made an emergency application of the brake the instant the locomotive passed the trip. Circuit-breakers were also located back of the trip some distance, from which the speed at time of applying the brake could be accurately determined. A more complete description of the testing apparatus is given in the appendix of this report.

The twelve-wheel cars (L. S. & M. S.) used in the test were equipped with the original foundation brake and apparatus as received from the car builders, being at that time the New York Central Lines' standard practice for that class of equipment. The apparatus was of the improved type, with supplementary reservoir to give 105 pounds emergency brake cylinder pressure at 110 pounds brake-pipe pressure, and for want of simpler description will be designated by the manufacturers' symbol, LN. The cylinder levers were changed to conform with the committee's recommendation for retardation at brake shoe. Additional apparatus was installed on each car, so that quick change could be made to the high-speed brake practice for comparison.

The normal weight of the car was approximately 126,000 pounds, and under the conditions laid down by the subcommittee this would not give the maximum permissible brake-shoe pressure. A pressure of 18,000 pounds per brake shoe was provided for, however, by loading one of the cars to 149,000 pounds; another was loaded to 140,000 pounds, as an intermediate step, and the remaining cars tested at normal weight.

The application of such force as 18,000 pounds to a brake shoe involved the design of a special brake beam, which was undertaken by a Cleveland concern, but in the limited time

available only a sufficient number were secured to equip the two heavy cars; the remaining cars were equipped with the regular high-speed brake beams of the same general design, which was of the trussed type, having an angle-iron compressing member and round-bar tension member. The special brake beam tested at 49,000 pounds with 1-16-inch deflection, as against 30,000 pounds for the beams used on the normal weight cars. It appears, therefore, entirely feasible to obtain brake beams which will meet the specification requirement contained in the subcommittee report.

The eight-wheel cars used in the test were equipped for high-speed brake, but additional apparatus was supplied to make a quick change to 105 pounds brake cylinder pressure, using the same brake leverage. The normal weight of these cars was 116,000 pounds, some 10,000 pounds heavier than the allowable weight recommended by the committee; for eight-wheel cars one shoe per wheel, so that the recommended retarding force could not be applied without exceeding the proposed limit of brake-shoe pressure.

It is regretted that on account of the unfavorable track conditions approaching the testing ground (a slightly ascending grade, with a bad curve two miles east of the trip) a speed of eighty miles per hour was not attained. Runs above sixty miles per hour were made at maximum speed of the locomotive instead of the program speed. The test was started on October 19 and continued until December 12, 1909, during which time two hundred and fifty-four runs were made, each and every one of which is recorded in the test log (8 sheets) which accompanies this report. S. W. Dudley, assisted by A. H. Elliott and other engineers under the direction of the committee, made a most thorough study and analysis of the data obtained from the tests, and their report is submitted as an appendix to this report, for the benefit of those who wish to make a detail study of the results. A meeting of the subcommittee was held at the general office of the Lake Shore & Michigan Southern, Cleveland, March 4, to consider the results of the test as applying to the assumptions on which their recommendations were based, and after reviewing the data as analyzed in the appendix to this report, the following modifications to their recommendations were agreed upon.

1. Allowable brake-shoe pressure recommended as 18,000 pounds per square inch. The results of the test seemed to indicate that under the test conditions a pressure of 18,000 pounds per shoe can be safely used, and this maximum shoe pressure will stand as originally recommended. Pressures as high as 26,000 pounds total, or over 500 pounds per square inch, were used at sixty miles per hour with all the brake shoes tested, with no apparent bad results, but when the stop was made at higher speeds it was noted that the plain cast-iron shoes would heat to a high degree, emitting molten metal, which deposited on the track, car trucks and body. The only positive indications, however, that the danger point had been reached was on run No. 328, Penna. cars with 20,700 pounds total, or 449 pounds per square inch, brake-shoe pressure, plain cast-iron shoes, speed, 74.75 miles per hour. On this stop a veritable flame of molten metal from 12 to 18 inches long was emitted from each of the shoes and a number of them were heated to a red heat in making the stop.

2. Brake cylinder leverage ratio recommended, 9 to 1. The results of the test seemed to indicate the ratio to be too high. On the L. S. & M. S. six-wheel truck cars the increase of running emergency piston travel over standing emergency piston travel was very noticeable, amounting to as much as 4 or 5 inches. The brake shoes are of necessity hung low on six-wheel trucks and the high braking power was sufficient to drag the shoes downward, imposing a force on the brake hangers sufficient to compress the equalizer springs solid. With 6-in. standing emergency piston travel there would be danger of the piston bottoming in the brake cylinder, especially after the cars had been in service some time, with boxes, pedestals, etc., worn sufficiently to produce additional false piston travel over that obtained in the tests. Car 824 was equipped with two cylinders, giving a cylinder leverage ratio of 5 to 1, and from a study of the performance of this car it is concluded that for this class of car, with brake-shoe centers at least 6 in. below center of wheel, a ratio of 6 to 1 should not be exceeded.

The P. R. R. four-wheel truck cars had brake shoes hung 1½ in. below the center line of wheel, and from the performance of these cars the lever ratio should not exceed 8 to 1. The recommendations would then stand:

Cars having brake shoes hung 0 to 2 in. below center line of wheel, lever ratio 8 to 1; 2 in. to 5 in. below, 7 to 1, and below 5 in., 6 to 1.

3. Time from brake application to brake effectiveness assumed by the committee as two seconds. In explanation, this term was based on the retarding effect produced after full cylinder pressure is obtained, and is the lapsed time when, if the average force had been instantly applied, the same

effect would be produced. It will be noted that every second of time taken from this term would have the effect of actually shortening the stop by a distance corresponding to the velocity in feet per second at the time when brake valve was operated in emergency application. As previously stated, the brake apparatus available at the time of equipping the test trains was 18-in. cylinders on all cars.

(A) Westinghouse LN equipment, designed to obtain in emergency, by means of a supplementary reservoir, a brake-cylinder pressure of 100 pounds at 8-in. piston travel with 110 pounds brake-pipe pressure.

(B) Westinghouse high-speed brake equipment, designed to give with 8-in. travel and 110 pounds brake-pipe pressure a maximum pressure of 80 pounds, which gradually blows down to 60 pounds toward the end of stop.

The test indicated that with the LN equipment the lapsed time was 2½ seconds, and with the high-speed equipment, 2¾ seconds. On account of excessive running emergency piston travel, however, but 95 pounds cylinder pressure was obtained with the LN equipment, instead of the 100 pounds expected. In order to obtain 105 pounds cylinder pressure with this equipment it was necessary to increase the brake-pipe pressure above 110 pounds.

Another triple valve was substituted for the LN triple valve, known as the LGN, with which it was expected to obtain 105 pounds emergency cylinder pressure with 110 pounds train-pipe pressure. This equipment used the same auxiliary reservoir and supplementary reservoir as the LN equipment, but obtained its higher pressure by first equalizing with the auxiliary reservoir, then closing the communication between cylinder and auxiliary reservoir and further equalizing with the supplementary reservoir. This equipment was deficient as to pressure obtained by about two pounds, on account of the long running emergency piston travel experienced. While the test was continued by increasing the brake-pipe pressure to give 105 pounds emergency cylinder pressure, under these conditions it could not be expected with 110 pounds brake-pipe pressure to make quite the same stop as in these tests. The lapsed time to brake effectiveness was the same with this equipment as with the LN. It became evident at this stage of the trials that unless the time from brake application to effectiveness could be shortened there would be small likelihood of making the stop in the desired distance of 1,200 feet.

In order to meet this condition the Westinghouse Air Brake Company undertook the design of an equipment which dispenses with the use of triple valves, using instead a valve of the general type of the distributing valve called a control valve. With this equipment larger pipes and ports between the air reservoirs and the brake cylinders can be used, thus materially shortening the time of obtaining maximum cylinder pressure. In the limited time available during the test they were able to design, build and install on the test train a complete experimental equipment of the type mentioned, and with this equipment the lapsed time between brake application to effectiveness was reduced to two seconds, which answered the requirements of the subcommittee, and with this equipment the desired stop was actually made.

4. Ratio of train weight to locomotive weight assumed by committee as 3 to 1. The six-car L. S. & M. S. train had a weight ratio, train to locomotive, 3.04 to 1, and the B. R. R. train ratio to locomotive was 2.8 to 1. It is seen, therefore, that the previous assumption of the committee represented fair average train conditions and will stand as first recommended.

4-A. Relative effectiveness of locomotive brake to car brakes assumed by committee as 50 per cent. These tests indicate a much greater relative effectiveness of the locomotive brake which, as shown by the results of break-away runs, where the improved type of locomotive and car brakes were used, should be increased to 75 per cent, and that figure is now recommended.

4-B. Ratio of train to car-brake efficiency derived from previous assumption of committee by combining assumptions in paragraphs 4 and 4-A, which was originally 5-6. Combining the revised factors, paragraphs 4 and 4-A, a factor 11-12 is derived.

5. Efficiency of brake gear assumed by committee as 85 per cent of the cylinder effect.

5-A. Coefficient of friction assumed by committee as 10 per cent.

5-B. The apparatus which the committee had available to determine the brake-gear efficiency was not of sufficient capacity to obtain satisfactory results with the heavy cars used in the test. Neither was apparatus available to determine the coefficient of friction. It was therefore necessary to combine these two factors by taking their product. With the committee's previous recommendations this factor is 85 per cent times 10 per cent, or 8.5 per cent. From the data of the break-away tests with the improved equipment, it appears

that not more than 7.5 per cent was realized. This factor should, therefore, be changed accordingly.

6. Concerning the additional retarding force to compensate for loads as previously recommended—3 per cent for sleeping-cars, 10 per cent for coaches and 15 per cent for load cars—it was thought advisable to modify this somewhat, to avoid complications in the maintenance of brake gear. The new recommendation would be to make no load allowance for sleeping-cars, coaches and other strictly passenger-carrying cars, except that the recommended retarding force would be considered as a minimum. For load cars an allowance of 15 per cent additional retarding force is recommended, which is considered as the maximum.

Returning to the formulæ for retardation, the new assumptions make the following changes:

$$S = \frac{11(S-2V)}{12} \text{ instead of } 5-6(S-2V).$$

1 = 0 for passenger-carrying cars.

1 = 15 per cent for load cars.

Then by the substitution of known values in equation (4) the revised retarding force becomes:

F = 12.8 per cent for passenger cars.

F = 14.7 per cent for load cars.

One of the most interesting and instructive, if not the most important results of the test, was the determination, by means of the dynamometer car, of the loss in tractive effort due to brake shoes rubbing the wheels.

The ten-car, twelve-wheel car train, with dynamometer car between locomotive and cars with brake adjusted at 6-in. standing emergency piston travel, required a drawbar pull of 8,370 pounds at sixty miles per hour, and on the next run same train, but with brakes adjusted at 7-in. standing emergency piston travel and brake shoes pried free of the wheels, the drawbar pull was only 6,200 pounds at the identical speed, indicating a loss of 35 per cent tractive effort on the train with brake shoes rubbing the wheels. These forces were the average forces apportioned to speed over one mile of the run, obtained by subtracting the calculated uniform accelerating force from the observed average dynamometer pull in each case, and this accelerating force was so small and practically uniform in both cases as to be negligible. The 6-in. piston travel in emergency would probably amount to 7-in., or the maximum allowable in service, so that on trains with heavy cars equipped with six-wheel trucks and a 9 to 1 and greater brake-leverage ratio, this loss is going on, day after day, on all our heavy, fast passenger trains. The recommendation of a 6 to 1 leverage, therefore, should be given consideration as the most rational method of correcting this great loss in tractive effort and corresponding waste of fuel. There are hundreds of cars running to-day wherein this saving can be effected and advantage of this knowledge should be taken.

From the revised assumption for cylinder leverage and brake-shoe coefficient of friction times brake efficiency, a new table follows, which gives the size of cylinders recommended by your committee for various weight cars and cylinder pressure 85 pounds per square inch.

#### PASSENGER-CARRYING CARS.

Brake shoes hung 5 in. and more below wheel centers.  
Brake leverage, 6 to 1.

Two 18-in. cylinders, cars weighing up to 154,000 lbs.  
Two 16-in. cylinders, cars weighing up to 121,000 lbs.  
Two 14-in. cylinders, cars weighing up to 93,000 lbs.

Brake shoes hung 2 to 5 in. below wheel centers.

Brake leverage, 7 to 1.

Two 18-in. cylinders, cars weighing up to 180,000 lbs.  
Two 16-in. cylinders, cars weighing up to 142,000 lbs.  
Two 14-in. cylinders, cars weighing up to 109,000 lbs.  
Two 12-in. cylinders, cars weighing up to 79,000 lbs.

Brake shoes hung 0 to 2 in. below wheel centers.

Brake leverage, 8 to 1.

Two 18-in. cylinders, cars weighing up to 205,000 lbs.  
Two 16-in. cylinders, cars weighing up to 162,000 lbs.  
Two 14-in. cylinders, cars weighing up to 124,000 lbs.  
Two 12-in. cylinders, cars weighing up to 91,000 lbs.

Limit of passenger-carrying cars, one shoe per wheel.  
12-wheel cars ..... 149,000 lbs.  
8-wheel cars ..... 100,000 lbs.

#### LOAD CARS.

Brake shoes hung 5 in. and more below wheel center.  
Brake leverage, 6 to 1.

Two 18-in. cylinders, cars weighing up to 134,000 lbs.  
Two 16-in. cylinders, cars weighing up to 106,000 lbs.  
Two 14-in. cylinders, cars weighing up to 81,000 lbs.

Brake shoes hung 2 to 5 in. below wheel centers.

Brake leverage, 7 to 1.

Two 18-in. cylinders, cars weighing up to 156,000 lbs.  
Two 16-in. cylinders, cars weighing up to 123,000 lbs.  
Two 14-in. cylinders, cars weighing up to 95,000 lbs.  
Two 12-in. cylinders, cars weighing up to 70,000 lbs.

Brake shoes hung 6 to 2 in. below wheel centers.	
Brake leverage, 8 to 1.	
Two 18-in. cylinders, cars weighing up to 178,000 lbs.	
Two 16-in. cylinders, cars weighing up to 141,000 lbs.	
Two 14-in. cylinders, cars weighing up to 108,000 lbs.	
Two 12-in. cylinders, cars weighing up to 80,000 lbs.	
Limit of load cars, one shoe per wheel.	
12-wheel cars	129,000 lbs.
8-wheel cars	86,000 lbs.

[NOTE.—The Executive Committee thought it unnecessary to print the details of tests conducted, and which appear in the form of an appendix to the original report, but they will appear in the annual report of proceedings in complete form.—SECRETARY.]

T. L. Burton (C. of N. J.): My understanding was that the report was to be received largely as a progress report and brought to the attention of the Executive Committee. We have deemed that this committee, or a special one, should be appointed to draw up specifications for a recommended practice. I do not think there is anything to be acted upon as recommended practice.

J. M. Christopher (T. H. & B.): Do I understand the Committee favored the flange shoe over the plain shoe?

T. L. Burton: The Committee made no recommendation as to flanged shoes. My own experience has been that a flanged shoe can be used to very good advantage when it is used on



T. H. Curtis,  
First Vice-President, M. C. B. Association.

### II.—Tests of Triple Valves.

A number of tests were conducted on the Master Car Builders' air-brake testing rack in the Engineering Laboratory, Purdue University, Lafayette, Ind., March 7 to 12, 1910.

The data for these tests are included in the report, but are not reproduced, since the committee does not feel that sufficient data have been obtained to justify it in recommending a new code of tests for triple valves."

### III.—Matters Referred to Committee.

The Executive Committee and other committees and individual members of this Association have referred several matters to the committee, but on account of the very large amount of detail work covered during the past year and also due to the fact that several of these communications were received after April 1, the committee has been unable to give them proper consideration in time for presentation to this convention.

The report is signed by: A. J. Cota (C. B. & Q.), chairman; F. H. Scheffer (N. C. & St. L.), R. K. Reading (P. R. R.), E. W. Pratt (C. & N. W.), R. B. Kendig (L. S. & M. S.), T. L. Burton (C. R. R. of N. J.), and B. P. Flory (N. Y. O. & W.).

a brake-beam having an adjustable head, provided with sufficient lateral movement to permit the shoe to adjust itself to the flange under all conditions. Unless the brake is adjustable and has some lateral movement, a slight deflection of the beam under heavy load gives distressing sliding. It seems that the shoe can also be used on what is known as the beamless type of brake, such as we have on a number of the more modern steel cars. There is no question but that the use of the flange shoe on the brake referred to materially increases the efficiency of the brake.

G. W. Wildin (N. Y., N. H. & H.): This report gives two 18-in. cylinders in two cases. If I read this right, everything would be 18-in. cylinders.

The President: Mr. Pratt cleared that up by saying that was not in accordance with the views of all the members of the committee. I think Mr. Wildin is correct. The impression intended to be conveyed was that where a certain size cylinder was specified, it could be used for that weight and down. That is, those are the maximum weights specified. Mr. Pratt very wisely suggested that the committee should have the privilege of reviewing those statements.

J. F. Devoy (C. M. & St. P.): We are going absolutely wild on this brake question. I do not wish to be understood as criticising this report in the slightest manner. In my opinion it indicates and clearly states everything that is absolutely true on the question. It is of vital importance to the Chicago, Milwaukee & St. Paul for the reason that we are now getting a very large number of steel cars. A leverage of 9 to 1 is an impracticable affair; aside from the fact that it does create more braking power and costs you more money, you cannot operate it on any wheel made, whether it is cast steel or forged steel, for the reason that the brake shoe will cause heating to such an extent that the wheel and the brake-shoe will absolutely fuse. So the question as to what brake or brake-shoe is best is entirely irrelevant to the matter. It is the question of the amount of pressure exerted on the wheel.

The question was also raised as to whether the report meant one or two brake cylinders. The cars that you are

You will spend more money on your brake-shoes—four times over what the whole thing will cost. The committee should take up not only the questions involved in this test, but as to whether you have a wheel and brake-shoe which will do the business required of it.

The report of the committee was received, and the committee is continued.

The following committees were appointed: Correspondence and Resolutions: R. F. McKenna, H. E. Passmore and J. W. Fogg.

Committee on Obituaries: For P. H. Peck—J. W. Taylor. For J. F. Divine—R. E. Smith. For J. J. Ellis—William Moore.

Secretary: In accordance with Article VI, section 4 of the Constitution, the executive committee offers the following ten names as candidates for election on the committee on nominations; five of these are to be elected at the time the general election occurs on Friday: J. F. Deems, A. W. Gibbs, W. H.



Le Grand Parish,  
Second Vice-President, M. C. B. Association.

getting now in this country weigh 150,000 lbs. or thereabouts. One cylinder will not give the proper shoe clearance and the proper leverage to the brake beams and the levers to take care of the situation. Our cars were first specified with one cylinder, and after experimenting for eight months with 66 cars, we have come to the conclusion that nothing will handle the situation but two brake cylinders. Aside from that, we have found there is no brake arrangement designed today which will give the power. In other words, on one lot of sleeping cars we found the brake-pin shearing. On another lot of cars, by placing the required pressure on the wheels, it bent the brake levers. The whole craze today seems to brake a train in the shortest space possible. You had better go a little bit slower with your brake and your line pressures, or you will destroy the whole foundation. In other words, the state of the art today is not such as will absolutely guarantee your going ahead with the recommendations of this committee, as stated. You cannot do it. I would much rather see a brake on a passenger car that would stop it in 400 or 500 feet longer than the distance recommended.

Lewis, Wm. Garstang, A. E. Manchester, J. F. Walsh, M. K. Barnum, R. E. Smith, E. W. Pratt, C. A. Seley.

In the absence of Professor W. F. M. Goss, Professor Schmidt, of the University of Illinois, presented the report on Brake Shoes.

#### TESTS OF BRAKE SHOES.

In addition to its usual duty of investigating the properties of brake shoes, the committee has also been requested to consider and report upon the standards applying to brake beams. This report accordingly deals with both subjects, the former being discussed in Part 1 and the latter in Part 2.

#### PART 1.

##### BRAKE SHOES.

*Routine Tests.*—Since the presentation of its last report the committee has received from B. P. Flory, of the New York,

Ontario & Western, one brake shoe to be tested to determine its frictional qualities. The results of the tests are presented in Appendix C.

*Researches of the Year.*—Previous to 1907, the work of the committee consisted chiefly in determining the frictional



W. F. M. Goss.

qualities of brake shoes and in recommending specifications concerning their coefficients of friction. In 1907, and again in 1908, the researches of the committee were extended to include an investigation of the wearing qualities of shoes. In the reports of 1907 and 1908 there are presented certain data concerning the wear of shoes which, however, were not considered sufficient to warrant any recommendation concerning a specification with respect to wear, the chief lack being in any information concerning the effect of the shoes upon the wheel itself. To supply this deficiency, a wheel scale, referred to in the report for 1909, was purchased, and has been in operation during the current year. By its use, it has been possible to determine the loss of weight in the wheel under the action of the shoe, as well as the loss in the shoe itself.

In pursuance of the program outlined in previous reports and approved by the Association, the committee at the beginning of last year selected from cars in service twenty-eight brake shoes which are believed to be representative of the shoes now in use on the railways of the country. These twenty-eight shoes are of fourteen different kinds, each kind in duplicate. One set of fourteen shoes was submitted to the tests outlined below in the Master Car Builders' laboratory at Purdue University. The other set was tested upon the brake-shoe testing machine of the American Brake Shoe and Foundry Company, at Mahwah, New Jersey. A list of these twenty-eight shoes is given in Table 1, which also presents their trade names and other information.

These shoes have been tested under the following schedule:

- A. Tests to determine the coefficient of friction of the shoe under the current specifications.
- B. Tests to determine the loss in weight of the shoe under repeated applications.
- C. Tests to determine the loss in weight of the wheel under the repeated application of the shoe.

The fourteen shoes submitted to the Master Car Builders' laboratory at Purdue University were subjected to the entire schedule. The detailed report submitted by the authorities of Purdue University is included as Appendix A. The shoes submitted to the American Brake Shoe and Foundry Company were tested only for coefficient of friction, and the report of these tests is included as Appendix B.

*Acknowledgments.*—The committee has pleasure in acknowledging the interest taken in this work by Prof. C. H. Benjamin, dean of the Schools of Engineering of Purdue University; by Prof. L. E. Endsley, of that institution, who has had immediate supervision of the work of the laboratory; by F. W. Sargent, chief engineer of the American Brake Shoe and Foundry Company, who has kindly placed at the disposal of the committee the testing facilities which are under his control, and by Prof. Edward C. Schmidt, of the University of Illinois, who has generously acted as secretary to the committee and has given important aid in the drafting of this report.

#### Coefficient of Friction.

Each of the twenty-eight shoes has been tested to determine its coefficient of friction under the current specifications of the Association. The coefficient of friction has been determined on a cast-iron chilled wheel in effecting stops from an initial speed of forty miles per hour under three brake-shoe pressures, namely, 2,808, 4,152 and 6,840 pounds. The coefficient of friction has been determined on a steel-tired wheel in effecting stops from an initial speed of sixty-five miles per hour under shoe pressures of 2,808, 6,840 and 12,000 pounds. The fourteen shoes sent to the American Brake Shoe and Foundry Company were also tested on the steel-tired wheel under intermediate and higher pressures. The results of these tests, which are included in the reports of Purdue University and the American Brake Shoe and Foundry Company, have been summarized and are displayed in Table 2. They are also shown in Figs. 1 to 4. The results of the tests on the cast-iron wheel are shown in Figs. 1 and 2, while the results on the steel-tired wheel are shown in Figs. 3 and 4.

The coefficients of friction obtained by the American Brake Shoe and Foundry Company on their testing machine are, at the lower pressures, about the same as those obtained upon the Master Car Builders' standard machine; but at the higher pressures they are considerably lower. The explanation for such differences probably lies in the fact that the flywheel of the former machine is heavier and has, at a like speed, greater kinetic energy than the flywheel of the standard machine. As a result of this, the stops made with the former machine are longer and result in greater heating of the shoe. Because of this difference in the construction and

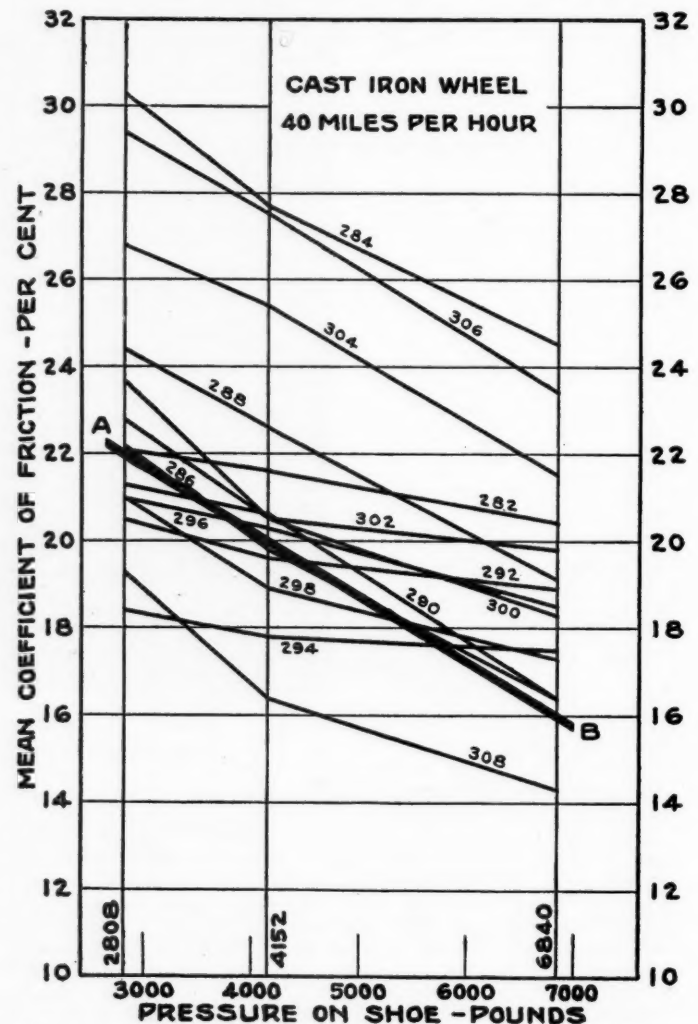


Fig. 1.—Coefficient of Friction Tests on Cast Iron Wheel, Purdue Univ.

in the characteristics of the two testing machines, the committee has limited its consideration to the results obtained in the laboratory of the Association at Purdue University, in determining upon its recommendations concerning coefficients of friction.

From its consideration of the results obtained upon the cast-iron wheel (see Fig. 1), the committee has decided to recommend that shoes when tested upon a cast-iron wheel, in effecting stops from an initial speed of forty miles per hour, shall develop a mean coefficient of friction of not less than

22 per cent when the brake-shoe pressure is 2,808 pounds,  
16 per cent when the brake-shoe pressure is 6,840 pounds.

The proposed specification is represented by the line AB in Fig. 1. The only change from the current specification involved in this recommendation is the omission of the specification at the intermediate pressure of 4,152 pounds. With rare exceptions, the shoe which meets the specifications at the two pressures stated will also meet them at the intermediate pressure, and the test at the third pressure is, therefore, considered to be unnecessary.

The current specifications require shoes to be tested on the steel-tired wheel at three different pressures. For the reasons just stated, the committee believes that tests under two pressures will be sufficient. In order to have the test conditions more nearly like those which prevail in practice, it seems desirable that the higher of these two shoe pressures should be 12,000 pounds. The committee accordingly recommends that shoes, when tested upon a steel-tired wheel, in effecting stops from an initial speed of sixty-five miles per hour, shall develop a mean coefficient of friction of not less than

12½ per cent when the brake-shoe pressure is 6,840 pounds.  
11 per cent when the brake-shoe pressure is 12,000 pounds.

This recommendation involves dropping from the current specifications the tests at pressures of 2,808 and 4,152 pounds and substituting therefor a test at a pressure of 12,000 pounds. The test at 6,840 pounds shoe pressure is retained; but the coefficient is increased from 12 per cent to 12½ per cent.

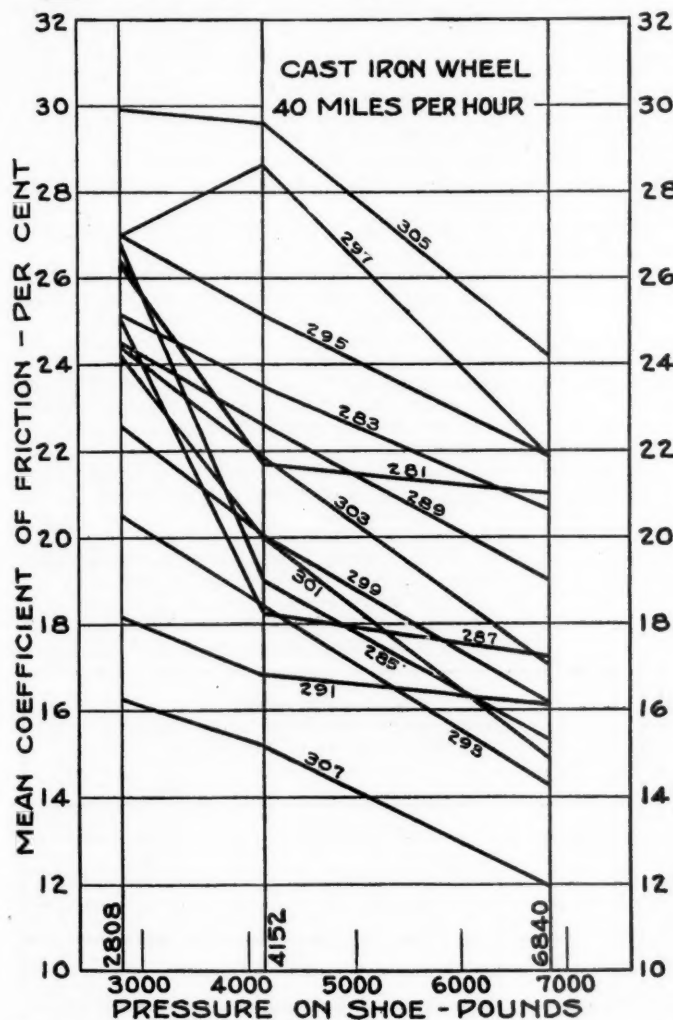


Fig. 2.—Coefficient of Friction Tests on Cast Iron Wheel, A. B. S. & F. Co.

This increase seems warranted by the results of the tests shown in Fig. 3. The line AB, in Fig. 3, represents the proposed specification.

The Association has, for some years, specified that the rise in the coefficient of friction at the end of a stop should not exceed 7 per cent. The experience of the laboratory during

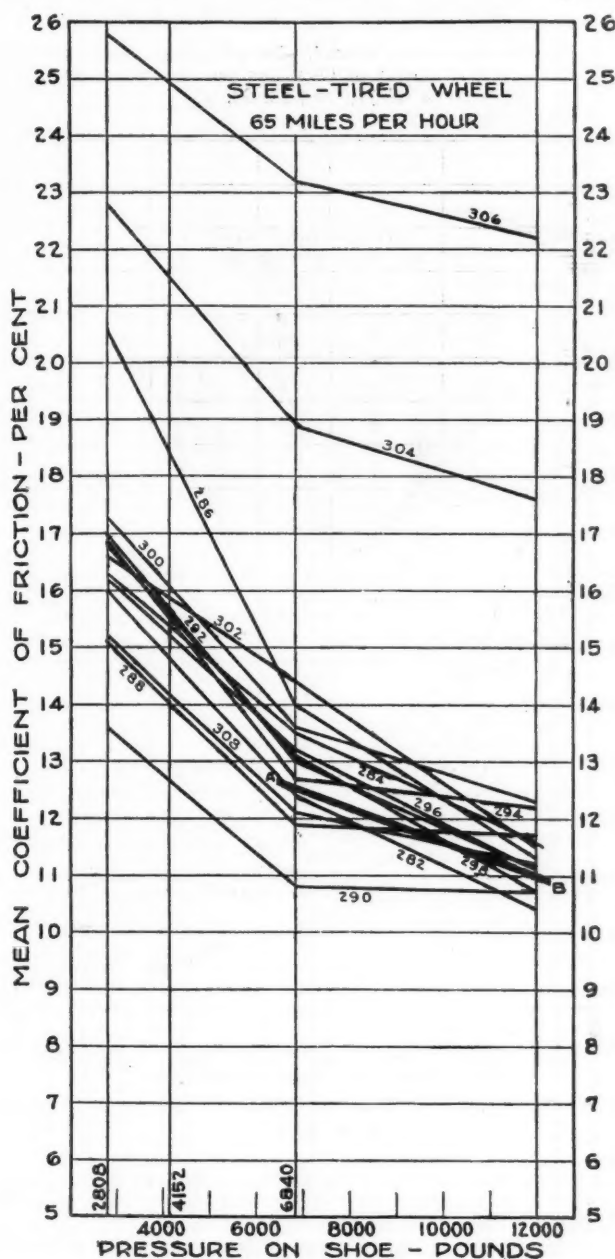


Fig. 3.—Coefficient of Friction Tests on Steel-tired Wheel, Purdue Univ.

the past four or five years indicates that a shoe which meets the specification concerning the *mean* coefficient also generally meets this requirement concerning the *final* coefficient. Whenever a shoe develops a final coefficient of friction in excess of the specifications it does so only within 4 or 5 feet of the end of the stop; and it is not likely, therefore, to have any harmful effect in service. For these reasons the committee believes that the specification concerning final coefficient of friction may properly be omitted from the standards of the Association, and it so recommends.

#### Shoe Wear and Wheel Wear.

Each of the fourteen shoes submitted to the laboratory at Purdue University was tested to determine its wear under repeated applications to both the cast-iron and the steel-tired wheel under the conditions cited below. Under these same conditions, the loss in weight of the wheel under the action of the shoe was determined by means of a scale especially designed for the purpose, which was referred to in last year's report, and which is described and illustrated in Appendix A. The shoe wear and wheel wear tests were run under the following conditions:

- A. On the cast-iron wheel.—At a constant speed of 20 miles per hour and at shoe pressure of 2,808 pounds.
- B. On the steel wheel.—At a constant speed of 20 miles per hour and at a shoe pressure of 2,808 pounds.
- C. On the steel wheel.—In effecting stops from an initial speed of 65 miles per hour and at a shoe pressure of 12,000 pounds.

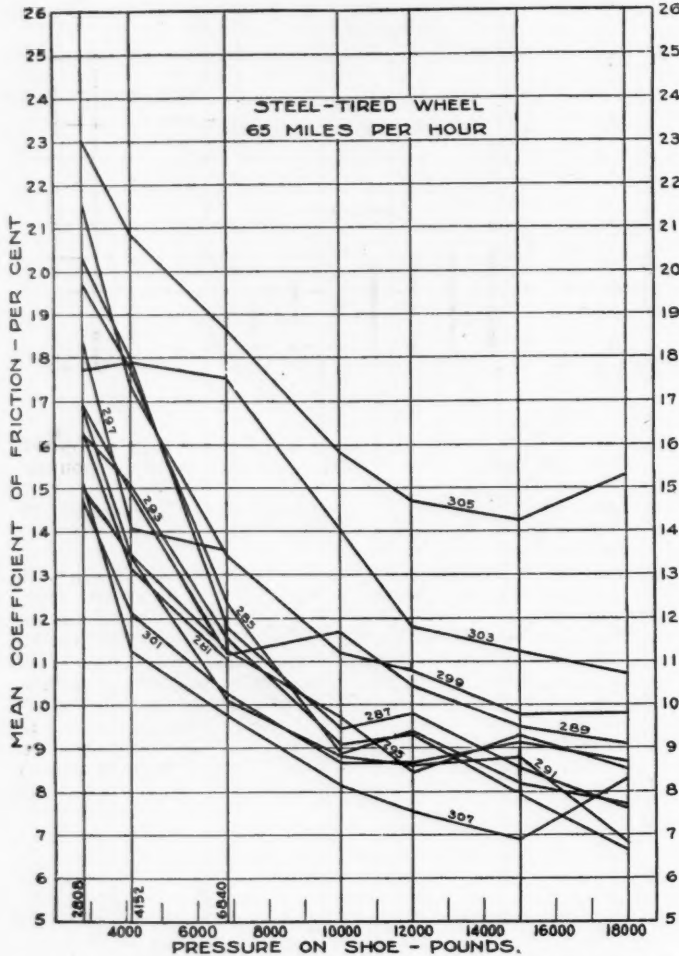


Fig. 4.—Coefficient of Friction Tests on Steel-tired Wheel, A. B. S. & F. Co.

During the tests at the lower pressure (conditions A and B) most of the shoes were applied 300 times to the wheel, while the latter was kept running at a constant speed of twenty miles per hour. A few of the thinner shoes were given only 200 applications, and in one case 100 applications only were made. These applications of the shoe to the wheel were made by means of an automatic device on the testing machine which operates to keep the shoe in contact with the wheel for about one minute, while the interval between contacts is about three minutes. At the end of each 100 applications, both the shoe and the wheel were weighed to determine the metal lost by abrasion.

The tests on the steel wheel at the higher pressure (condition C) were made by a process similar to that employed in determining the coefficient of friction. In most cases, nine stops were made from an initial speed of sixty-five miles per hour, after which both the shoe and the wheel were weighed to determine their loss. With two of the shoes, the number of stops was reduced to six instead of nine.

The results of the tests to determine shoe wear are summarized in Table 3, and the results of the wheel-wear tests are shown in Table 4. These results are also presented graphically in Figs. 5, 6 and 7, in which the shoe wear is represented in the lower part of the diagram, while the wheel wear is represented in the upper part.

**Results of the Tests on Wheel Wear.**—At a shoe pressure of 2,808 pounds, the only shoe which produced an appreciable wear on the cast-iron wheel is the Congdon shoe, No. 286. It is somewhat significant that this is the shoe showing the least shoe wear. During the tests on the steel wheel, at a pressure of 2,808 pounds, only two shoes caused any con-

siderable wear of the wheel. These are numbers 286 and 288, both Congdon shoes. Shoe 286, which was given 300 applications to the wheel, cut four V-shaped grooves about 1-32-inch deep and several smaller ones around its entire circumference. Shoe 288 had scored the wheel in a similar manner with five grooves after 100 applications. During the tests on the steel wheel at a pressure of 12,000 pounds, only two shoes produced any wear whatever on the wheel, and this was quite inconsiderable in amount. These shoes are Nos. 304 and 306, both Pittsburgh composition shoes. These two, however, did not score the wheel.

**Conclusions Concerning Wheel Wear.**—The results seem to warrant the conclusion that none of the ordinary shoes in service are likely to cause any appreciable wear on the cast-iron wheel. The wear on the steel wheel, while greater than on the cast-iron wheel, is likewise almost inconsiderable, except in the case of the two insert shoes above cited. The committee regards the scoring of the wheel in these two cases as more or less accidental, and experience with insert shoes in service seems to warrant this opinion. After consideration of all the facts here presented, the committee has concluded that no serious wear of the wheel is to be expected from the action of any of the shoes now in ordinary service, and it, therefore, considers any recommendation concerning wheel wear to be unnecessary.

The committee regards the reassurance which proceeds from such conclusions as ample return for the effort and expense which have been entailed by its research concerning the effect of brake shoes upon the wheel. Such conclusions also clear the way for a recommendation concerning the wear of the shoes themselves, which, until now, the committee has felt unable to make.

**Results of the Tests on Shoe Wear.**—The results of the shoe-wear tests are shown in Figs. 5, 6 and 7. The wear is there represented in terms of weight lost by the shoe per 100,000,000 foot-pounds of work done. These weights may be accepted as measures of the relative durability of all of the shoes except the composition shoes, Nos. 304 and 306. The density of the shell and filler of these two shoes is less than that of the metallic shoes in the ratio of 1 to 2.4. To compare the durability of these shoes with the durability of the others, their actual loss in weight should, therefore, be multiplied by 2.4. In the diagrams the dotted lines represent, for shoes 304 and 306, the weights obtained by increasing the actual loss in this ratio.

The facts presented in Figs. 5, 6 and 7 may be generalized as follows:

- a. The shoes tested present great variation in their wearing qualities, the ratio between the poorest and the best shoe being as great as 1 to 6.
- b. The relative resistance to wear exhibited by different shoes is somewhat affected by the severity of the application. Of a series of shoes, the one which suffers least from wear at light pressures may not be the one which suffers least under a heavy pressure.
- c. All shoes tested wear more rapidly on a steel-tired wheel than on a cast-iron wheel, when tested under like pressures.
- d. In general terms, it may be stated that the shoes which show a wear greatly below the average are those which cause wear in the wheel.
- e. All shoes show greater wear, per unit of work performed, when applied under the higher pressure. The ratio is occasionally as great as 1 to 10.

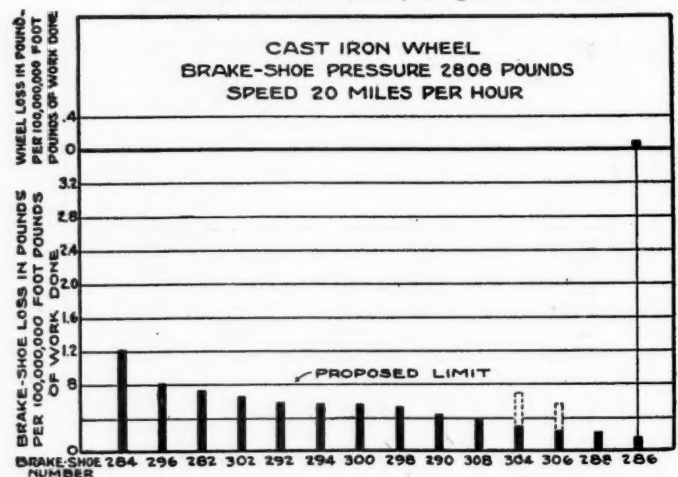


Fig. 5.

**Recommendations Concerning Shoe Wear.**—The committee recommends:

That on the cast-iron wheel the shoe wear be determined by making 100 applications of the shoe to the wheel, under a pressure of 2,808 pounds, and at a constant wheel speed of twenty miles per hour; at each application the shoe to be in contact with the wheel during 190 revolutions and out of contact during the succeeding 610 revolutions. That, under these conditions, the shoe shall lose in weight not more than 0.8 of a pound for each 100,000,000 foot-pounds of work done. That, on the steel tired wheel, the shoe wear be determined by making ten stops from an initial speed of sixty-five miles per hour, and under a shoe pressure of 12,000 pounds. That, under these conditions, the shoe shall lose in weight not more than 4.0 pounds for each 100,000,000 foot-pounds of work done. That, in the case of non-metallic shoes, these limits of wear be reduced in the ratio of the density of their abraded parts to the density of castiron.

The proposed wear limits are shown in Figs. 5 and 7. Only one of the shoes tested on the cast-iron wheel and one of those tested on the steel wheel fail to meet the proposed specifications. The shoes which develop a high coefficient of friction are also those which are likely to show the greater wear, and, if, therefore, the proposed wear limits are made more exacting than is here proposed, almost all of the

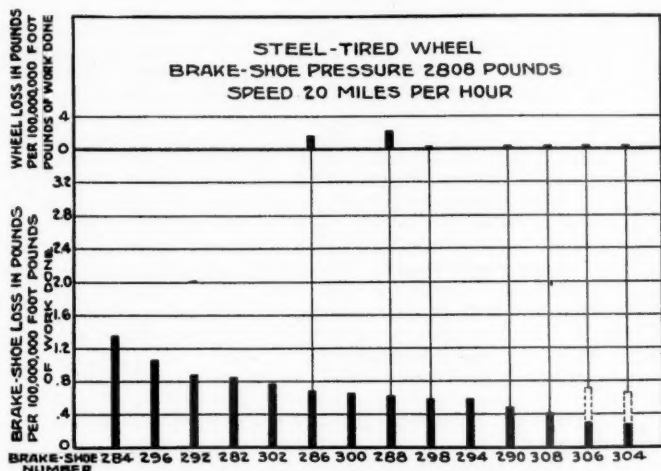


Fig. 6.

shoes which pass the specifications for coefficient of friction would be rejected under the specifications for wear. For these reasons, the committee concluded that the wear limits should not be made more exacting than is proposed in the recommendations above; and it believes that the proposed wear specifications, when combined with the specifications concerning coefficient of friction, will serve their main purpose of protecting the purchaser against the unusually soft shoe.

#### Shoe Gage and Thickness of Inserts.

**Shoe Gage.**—The Association has a standard gage for the brake head. Since the back of the shoe must fit this head, the committee believes that a limit gage for the back of the shoe ought also to be added to the standards, and it proposes for this purpose the gage shown in Fig. 8.

**Thickness of Inserts.**—In many insert shoes the inserts are so thin that they are either worn through or drop out during the first quarter of the life of the shoe. The committee believes that inserts should be made as thick as the processes of manufacture will permit, and it recommends that in no case should the thickness of the insert in the new shoe be less than one-half of the total depth of the shoe.

#### SUMMARY.

As a conclusion to Part 1 of its report, the committee presents the following summary of its suggestions concerning brake shoes, and recommends that they be adopted as standards of the Association:

1. That the specifications for brake shoes, shown on pages 589 and 590 of the Proceedings for 1909, be replaced by the following:

a. Shoes shall be tested for coefficient of friction and for wear upon the Master Car Builders' Association testing machine, or upon a machine with equivalent characteristics.

#### Coefficient of Friction.

b. Shoes shall develop upon the *cast-iron wheel*, in effecting stops from an initial speed of 40 miles per hour, a mean coefficient of friction of not less than

22 per cent when the brake-shoe pressure is 2,808 pounds.

16 per cent when the brake-shoe pressure is 6,840 pounds.

c. Shoes shall develop upon the *steel-tired wheel*, in effecting stops from an initial speed of 65 miles per hour, a mean coefficient of friction of not less than

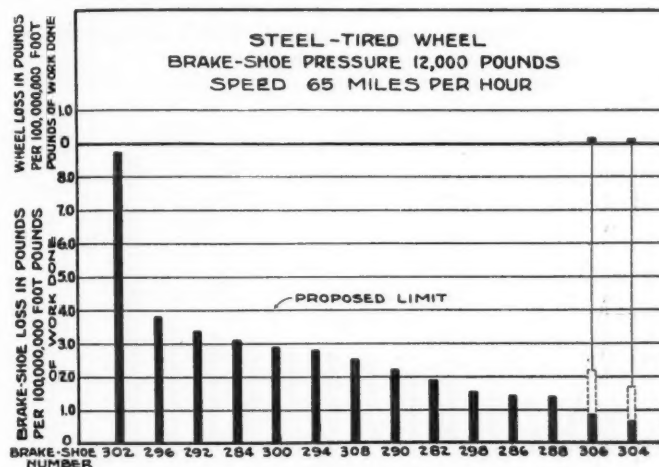


Fig. 7.

12½ per cent when the brake-shoe pressure is 6,840 pounds.  
11 per cent when the brake-shoe pressure is 12,000 pounds.

d. No limitation is placed upon the rise in coefficient of friction at the end of the stop.

#### Shoe Wear.

e. Shoe wear shall be determined upon the *cast-iron wheel*, by making not less than 100 applications of the shoe to the wheel, under a pressure of 2,808 pounds, and at a constant peripheral speed of the wheel of twenty miles per hour. At each application the shoe shall remain in contact with the wheel during 190 revolutions of the latter, and between applications the shoe shall remain out of contact during 610 revolutions of the wheel. Under these conditions, the shoe shall lose in weight not more than 0.8 of a pound for each 100,000,000 foot-pounds of work done.

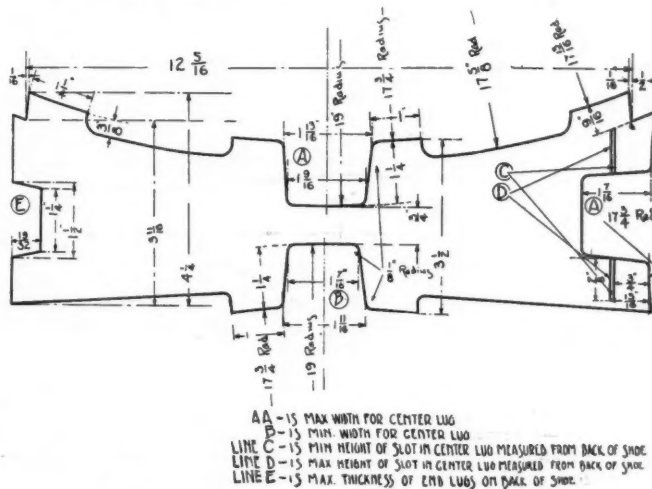


Fig. 8.—Standard M. C. B. Brake Shoe Gage.

f. Shoe wear shall be determined upon the *steel-tired wheel*, by making not less than ten stops from an initial speed of sixty-five miles per hour and under a pressure of 12,000 pounds. Ten minutes shall intervene between successive applications of the shoe. Under these conditions, the shoe shall lose in weight not more than 4.0 pounds for each 100,000,000 foot-pounds of work done.

g. When a shoe not entirely metallic in its composition is tested for wear, its actual loss in weight shall be increased in the ratio which the density of cast iron bears to the mean density of the abraded parts of the shoe, in order to determine the weight which is to be compared with the specifications.

2. That the back of the shoe be made to conform to the gauge shown in Fig. 8, and that this gauge be shown on Sheet M. C. B.—17.

3. That, under the heading "Brake Head and Shoe," page 588 of the Proceedings for 1909, there be added the following: "All inserts in brake shoes must extend in new shoes to a depth equal to at least one-half of the total shoe depth."

## PART 2.

## BRAKE BEAMS.

The Executive Committee referred to the committee on Brake Shoes last July the reconsideration of present standards concerning brake beams. Previous to its first meet-

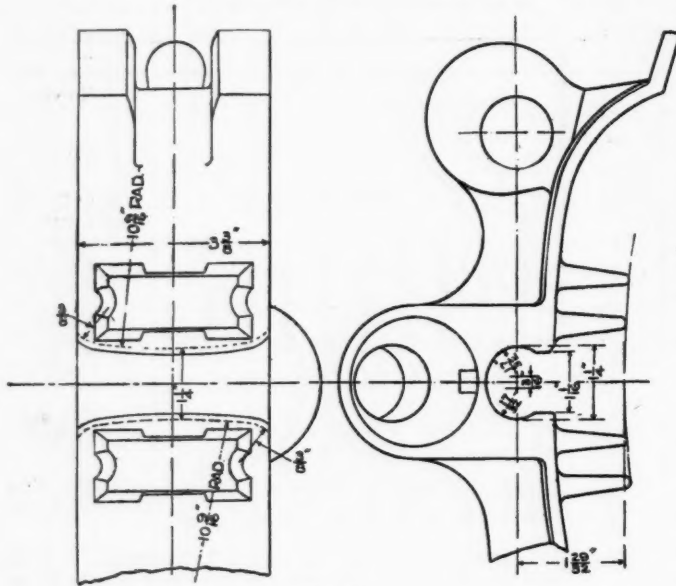


Fig. 9.

ing during the year, your committee had summarized for its information all actions and discussions of the Association on this subject since the report of the first special committee on brake beams which was presented at the convention in 1906. After a study of all previous actions shown by this summary, the committee decided to limit its consideration of changes in standards to—(1) size of the hanger hole in the brake head, (2) certain changes in the specifications for beam tests, and (3) limiting dimensions governing the outline for brake beams. Suggestions concerning the three items were embodied in a circular of inquiry which was sent to the members in January.

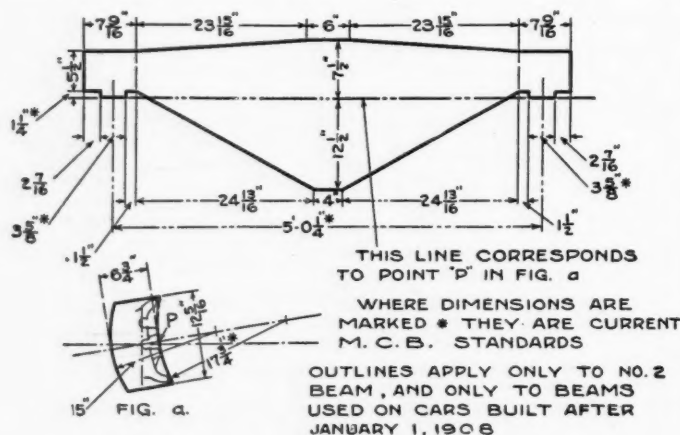


Fig. 10.—Limiting Outline for Brake Beams.

The committee has invited the manufacturers of brake beams to send representatives to its meetings, and representatives of the following companies have been present during certain of its discussion: The American Steel Foundries, The Chicago Railway Equipment Company, The Damascus Brake Beam Company, The Davis Brake Beam Company.

The suggestions made by these representatives have been given due consideration along with the replies received to the circular of inquiry.

**Brake Head Hanger Hole.**—In the circular it was proposed to increase the size of the hanger hole sufficiently to permit the use of a 1-inch hanger as well as the 3/8-in. hanger.

Table 1.

Brake Shoes Selected for Tests.

SERIAL NO.	PURDUE LABORATORY NO.	DESIGNATION	OBTAINED FROM	MARKS FOUND ON SHOE
1	281	PLAIN CAST IRON	TRUCK IN C. & N. W. SHOPS	C. & N. W. 8386
2	282	PLAIN CAST IRON	" " " " " "	C. & N. W. 8386 (NO. NOT CLEAR)
3	283	PLAIN CAST IRON—WITHOUT REINFORCEMENT	C. & N. W. CAR NO. 92327	2100 C
4	284	" " " " " "	C. & N. W. CAR NO. 61861	2100 C
5	285	CONGDON 7 INSERTS	TRUCK IN C. & N. W. SHOPS	C. & N. W. 8386
6	286	" " " " " "	" " " " " "	C. & N. W. 8386-1
7	287	CONGDON—STEEL BACK 9 INSERTS	C. & N. W. CAR NO. 9512	CC 2 8 G
8	288	" " " " " "	C. & N. W. CAR NO. 10356	CC 2 8 G
9	289	" " " " " "	I. C. CAR NO. 23572	(NONE FOUND)
10	290	STREETER—STEEL BACK	C. & N. W. CAR NO. 8460	(NOT DISTINGUISHABLE) 8 & 9
11	291	" " " " " "	C. & N. W. CAR NO. 98226	(1) 4 1193 FREIGHT N.Y.C. LINES
12	292	LAPPIN—CHILLED ENDS	" " " " " "	(1) 4 1193 FREIGHT N.Y.C. LINES
13	293	" " " " " "	C. & N. W. CAR NO. 307	(1) 4 1193 FREIGHT N.Y.C. LINES
14	294	" " " " " "	N.Y.C. H.R. CAR NO. 69732	N.Y.C. LINES FREIGHT
15	295	PLAIN CAST IRON—STEEL BACK	P.W. SARGENT, AMER. B.S.P. CO.	(NOT NOTED)
16	296	" " " " " "	" " " " " "	PATENTED D. 3 N-2470-4-1193
17	297	COLUMBIA	B. D. LOCKWOOD—FROM CHICAGO CAR	(NOT NOTED)
18	298	" " " " " "	" " " " " "	C. H. & D. 1507
19	299	DIAMOND S—STEEL BACK	" " " " " "	(1) G 724 4
20	300	" " " " " "	DITTO	(1) G 724 4
21	301	WALSH	J. A. SPOONER OF THE CHICAGO J.C. RY.	(PRICK PUNCHED) C J
22	302	" " " " " "	" " " " " "	(PRICK PUNCHED) C J
23	303	PITTSBURG—HALLSABLE SHELLS	" " " " " "	PITTSBURG BRAKE SHOES CO. PITTSBURG, PA.
24	304	" " " " " "	" " " " " "	PITTSBURG BRAKE SHOES CO. PITTSBURG, PA.
25	305	PITTSBURG—STEEL SHELLS	" " " " " "	PITTSBURG CO. BRAKE SHOES, PITTSBURG, PA.
26	306	" " " " " "	" " " " " "	PITTSBURG CO. BRAKE SHOES
27	307	NATIONAL	W. B. CHICK ON THE AT. & P. RY.	(NOT DISTINGUISHABLE)
28	308	" " " " " "	" " " " " "	36 (NO. NOT CLEAR)

The change was suggested on account of the breakage of the 3/8-in. hanger under some conditions of service. To the inquiry on this point seventeen replies were received, twelve of which advocated the proposed change. In the five other replies the change is opposed only on account of the increased play which would be allowed when a 3/8-in. hanger would be used in the larger hole. In some of these replies the 3/8-in. hanger is held to be sufficiently strong, especially if it be made with a larger fillet at the bend than is at present customary. After considering all the replies, the committee has decided to recommend the proposed change, and it believes that the edges of the hole ought also be rounded out to permit the use of a filleted hanger. It, accordingly, recommends that the present standard brake head be so modified as to conform in these respects to the head shown in Fig. 9.

**Specifications for Tests.**—The committee in its circular of inquiry made certain suggestions looking toward a modification of the test procedure for determining beam deflection. This, however, it has finally decided not to recommend. The committee has reconsidered the current test specifications, and it believes that changes are desirable in the two respects referred to below. The present specifications require that, as a preliminary to the deflection tests for both the No. 1 and the No. 2 beams, a load of 6,000 pounds be applied and then released; after which the load for producing deflection is applied. The committee believes that the preliminary load for the No. 1 beam should be reduced to 4,000 pounds, and it so recommends. It is thought that the change will result in more careful assembling of the beam.

The current specifications require no test for the ultimate strength of the beam. On account of the diversity in beam

SHOE NUMBER	LABORATORY AT WHICH THE TEST WAS MADE	MEAN COEFFICIENT IN PER CENT. INITIAL SPEED OF 40 M.P.H. CAST IRON WHEEL				MEAN COEFFICIENT IN PER CENT STOPS FROM AN INITIAL SPEED OF 65 M.P.H. STEEL-TIRED WHEEL						
		SHOE PRESSURE—LBS.				SHOE PRESSURE — LBS						
		2808	4152	6840		2808	4152	6840	10000	12000	15000	18000
281	AB38FG	2.03	2.17	2.10	16.3	13.1	11.0					
282	PURDUE	22.1	21.6	20.4	16.0		12.4		10.4			
283	AB38FG	25.1	23.5	20.6	—	—	11.7					
284	PURDUE	30.3	27.7	24.5	16.3		13.5		11.6			
285	AB38FG	26.8	19.0	15.3	19.7	17.7	12.4	6.9	9.4	8.1	7.7	
286	PURDUE	22.2	19.6	16.4	20.6		14.0		11.3			
287	AB38FG	25.0	18.3	17.2	20.3	18.0	11.8	7.5	9.8	8.5	7.6	
288	PURDUE	24.4	21.6	19.1	15.1		11.2		11.7			
289	AB38FG	24.5	21.6	19.0	16.9	14.9	11.1	11.7	10.4	9.5	9.1	
290	PURDUE	21.3	20.9	16.4	13.6		10.8		10.7			
291	AB38FG	18.2	16.8	16.1	15.0	13.4	10.1	8.8	8.6	8.8	8.8	
292	PURDUE	20.5	19.6	18.9	17.0		13.0		11.1			
293	AB38FG	20.5	18.4	14.3	16.3	15.1	11.6	9.1	9.3	7.9	6.6	
294	PURDUE	18.4	17.6	17.5	16.9		12.7		12.2			
295	AB38FG	27.0	25.1	21.9	16.9	13.5	11.3	9.7	8.4	9.3	8.5	
296	PURDUE	21.0	20.3	18.2	16.2		13.2		11.1			
297	AB38FG	27.0	25.6	21.5	18.4	14.0	13.5		11.7			
298	PURDUE	21.0	18.9	17.3	16.8		13.1		10.7			
299	AB38FG	24.2	20.0	16.2	21.5	17.4	13.8	11.2	10.8	9.8	9.8	
300	PURDUE	22.6	20.5	18.3	17.3		13.6		12.3			
301	AB38FG	22.6	20.6	14.9	14.7	13.1	10.3	8.7	8.6	9.1	8.7	
302	PURDUE	23.7	20.5	19.8	16.6		14.4		11.5			
303	AB38FG	24.4	21.9	17.6	17.9	14.5	14.0	11.8	11.2	10.7		
304	PURDUE	22.8	20.4	18.4	18.9							
305	AB38FG	29.9	29.6	24.2	23.0	20.9	18.7	15.8	14.7	14.2	15.3	
306	PURDUE	23.4	21.5	23.4	25.8		23.2		22.2			
307	AB38FG	16.3	15.2	11.9	15.1	11.3	9.8	8.2	7.5	6.9	8.3	
308	PURDUE	19.3	16.4	14.3			12.1		11.2			

Table 2.

Mean Coefficients of Friction Developed by Each Shoe on Cast Iron and Steel-Tired Wheels.

designs the deflection test gives but little information concerning their ultimate strength. The committee, therefore, considers it desirable that the beam be finally tested to destruction, and that under this test the maximum load borne shall not be less than 20,000 pounds for the No. 1 beam, 38,000 pounds for the No. 2 beam, and it recommends that such tests be added to the specifications.

Paragraph 2, under "Brake Beams," on page 590 of the Proceedings for 1909, is in conflict with the test specifications. The committee recommends that it be omitted.

**Brake-beam Limit Outline.**—In its circular, the committee proposed the establishment of an outline which should serve to limit the dimensions of the beam. The purpose of the suggestion is to facilitate replacements of beams on cars in interchange. To the inquiry on this matter fifteen replies were received, in none of which was the feasibility of establishing such a limit called in question. The beam manufacturers have likewise endorsed the proposal. After consideration of the replies received from the railway companies and of the dimensions submitted by the manufacturers, the committee has prepared the outline which is represented in

SHOE NUMBER	DESIGNATION OF THE SHOE	LABORATORY AT WHICH THE TESTS WERE MADE	WHEN TESTED ON THE CAST IRON WHEEL		WHEN TESTED ON THE STEEL-TIRED WHEEL	
			SHOE PRESS—2800 LBS. NUMBER OF SHOES APPLIED	SHOE LOSS IN POUNDS PER 100,000,000 FOOT-POUNDS OF WORK DONE	SHOE PRESS—2800 LBS. NUMBER OF SHOES APPLIED	SHOE LOSS IN POUNDS PER 100,000,000 FOOT-POUNDS OF WORK DONE
282	PLAIN CAST IRON	PURDUE	400	.743	300	.856
284	PLAIN CAST IRON WITHOUT RELIEF DEPRESSION	PURDUE	300	1.225	100	1.360
286	CONGDON	PURDUE	200	.163	300	.706
288	CONGDON—STEEL BACK	PURDUE	300	.212	100	.633
290	STREETER—STEEL BACK	PURDUE	300	.433	300	.482
292	LAPPIN—CHILLED ENDS	PURDUE	500	.592	300	.885
294	LAPPIN—CHILLED ENDS	PURDUE	300	.572	300	.570
296	PLAIN CAST IRON STEEL BACK	PURDUE	300	.820	300	1.058
298	COLUMBIA	PURDUE	100	.537	100	.592
300	DIAMOND S STEEL BACK	PURDUE	300	.565	300	.662
302	WALSH	PURDUE	300	.671	300	.784
304	PITTSBURG HALLSABLE SHELL	PURDUE	200	.292	200	.273
306	PITTSBURG STEEL SHELL	PURDUE	200	.239	200	.299
308	NATIONAL	PURDUE	300	.396	300	.413

Table 3.

#### Results of Tests to Determine Shoe Wear on Cast Iron and Steel-Tired Wheels.

Fig. 10. It recommends that the Association adopt as a standard this outline within which all parts of the No. 2 beam must fall, it being further understood that the recommendation is to apply only to beams used on cars built after January 1, 1908.

**Use of the No. 2 Beam.**—The committee believes that the use of the No. 2 beam should be required on cars of more than 35,000 pounds light weight. The current standards are open to misinterpretation at this point. It, accordingly, recommends that the paragraph on page 591 of the Proceedings for 1909, which reads, "Beam No. 2 to be suitable for cars exceeding 35,000 pounds light weight," be changed to read: "Beam No. 2 must be used on cars of more than 35,000 pounds light weight, and it may be used on cars of 35,000 pounds light weight or less."

**An Editorial Change in Current Standards.**—On page 591 of the Proceedings for 1909, the last paragraph under the heading "Brake Beam Specifications and Tests" reads as follows: "On cars built after September 1, 1909, it will not be permissible to hang brake beams from any portion of the body of the car." Your committee believes that this statement would more appropriately appear under the heading of "Brake Beams" in the preceding section, and recommends that it be shifted to that place.

**Inside Hung Beams.**—The Committee on Brake Beams, reporting in 1906, suggested for Recommended Practice that "all beams be inside hung." The whole report of this brake-beam committee was referred to the Committee on Standards, who, reporting in 1907, approved the recommendation noted above, provided it were construed as not requiring outside hung beams then in service to be changed. All other recommendations of the Committee on Standards, except this one item, were submitted to letter ballot in 1907. There is nothing in the discussion before the convention to warrant this omission from the ballot, and that it was not there included is probably due to an error. Your committee, therefore, recommends that this provision be restored to the Recommended Practice of the Association.

#### SUMMARY.

As a conclusion to Part 2 of its report, the committee presents the following summary of its recommendations concerning brake beams:

#### Standard:

- That on Sheet M. C. B.—17, the drawing of the brake head be modified as regards the size and shape of the hanger hole, so that it conforms to Fig. 9 of this report.
- That, under "Brake Beam Specifications and Tests," page 591 of the Proceedings for 1909, the last two sentences of the second paragraph be omitted; and that in their place there be substituted the following:

#### "a. Beam No. 1:

"Apply an initial load of 4,000 pounds, then reduce it to zero.

"Apply a test load of 6,500 pounds and under this load measure the deflection, which shall not exceed 0.0625 inch.

"Next load the beam until failure occurs. Under this test the maximum load borne by the beam shall not be less than 20,000 pounds.

#### "b. Beam No. 2:

"Apply an initial load of 6,000 pounds, and then reduce it to zero.

"Apply a test load of 12,000 pounds and under this load measure the deflection, which shall not exceed 0.0625 inch.

"Next load the beam until failure occurs. Under this test the maximum load borne by the beam shall not be less than 38,000 pounds."

- That the second paragraph under the heading "Brake Beams," on page 590 of the Proceedings for 1909, be omitted.
- That all No. 2 beams used on cars built after January 1, 1908, shall be of such dimensions that all parts of the beam will lie within the outline shown in Fig. 10 of this report; and that this outline be shown among the standard drawings.
- That, on page 591 of the Proceedings for 1909, the seventh paragraph, relating to beam No. 2, be changed to read: "Beam No. 2 must be used on cars of more than 35,000 pounds light weight, and it may be used on cars of 35,000 light weight or less."
- That the last paragraph on page 591 of the Proceedings for 1909 be printed under the heading "Brake Beams," in the preceding section.

#### Recommended Practice:

- That all beams be inside hung.

In concluding this report, the committee desires to express

SHOE NUMBER	DESIGNATION OF THE SHOE	CAST IRON WHEEL		STEEL-TIRED WHEEL	
		SHOE PRESS—2800 LBS. NUMBER OF SHOES APPLIED	WHEEL WEAR IN POUNDS PER 100,000,000 FOOT-POUNDS OF WORK DONE BY SHOE	SHOE PRESS—2800 LBS. NUMBER OF SHOES APPLIED	WHEEL WEAR IN POUNDS PER 100,000,000 FOOT-POUNDS OF WORK DONE BY SHOE
282	PLAIN CAST IRON	400	0.0004	300	0.0046
284	PLAIN CAST IRON	300	NONE	100	NONE
286	CONGDON	200	0.0859	300	0.1685
288	CONGDON	300	0.0063	100	0.2330
290	STREETER	300	NONE	300	0.0192
292	LAPPIN—CHILLED ENDS	300	"	300	0.0003
294	LAPPIN—CHILLED ENDS	300	"	300	NONE
296	PLAIN CAST IRON	300	"	300	NONE
298	COLUMBIA	100	"	100	0.0123
300	DIAMOND S	300	"	300	0.0016
302	WALSH	300	"	300	NONE
304	PITTSBURG HALLSABLE SHELL	200	0.0045	200	0.0209
306	PITTSBURG STEEL SHELL	200	0.0026	200	0.0192
308	NATIONAL	300	NONE	300	0.0242

Table 4.

#### Results of Tests to Determine Wheel Wear.

its opinion that, if its recommendations above stated in Parts 1 and 2 be accepted, it considers its work to be finished for the present, and it suggests, therefore, that the committee as a standing committee be discontinued.

The report is signed by: W. F. M. Goss (Univ. of Ill.), chairman; William McIntosh and J. R. Onderdonk (B. & O.).

Professor Schmidt: The committee has made a recommendation concerning a shoe gage (Fig. 8). The Association has a standard gage for the head itself, with certain allowable limits of variation in the casting of that head. It seems logical, therefore, that the shoe to fit the head should be limited by gage. The committee proposes the gage as a means of facilitating purchase of brake shoes, and insuring facility in interchange.

The President: Professor Schmidt suggests that inasmuch as the committee is making practically two reports, one on brake shoes and one on brake beams, that it might be well to take up this question of brake shoes and dispose of it before taking up the question of brake beams. The part of the paper dealing with brake shoes is now open for discussion.

T. R. Burton (C. of N. J.): Has consideration been given to the effects on the coefficient of friction of brake shoes and the wear resulting from continuous contact between the

wheels is entirely omitted from the recommendation, steel-tired wheels only are mentioned, and I believe they should be included.

The committee on brakes recommends an allowable brake pressure of 18,000 lbs. The committee on brake shoes gives the coefficient of friction for 12,000 lbs., and makes no mention of the braking pressure which the other committee specifies is the allowable pressure. It would seem to me, to make it consistent, that if we specify 18,000 lbs., as the allowable braking pressure in one case, we should in the other report give the coefficient of friction for the 18,000 lbs., to make the two reports consistent.

F. W. Sargent: If the last speaker will look at the back of the report he will find the record there giving the coefficient of friction at 18,000 lbs. load, or 400 lbs. to the square inch of shoe face; tests made on the American Brake Shoe & Foundry machine

Professor Schmidt: I am not sure how far I may reflect the



A. Stewart,  
Third Vice-President, M. C. B. Association.

shoe and wheel in heavy grade service? It is a fact that a large percentage of brake-shoe consumption occurs on roads operating on heavy grades, and it is also difficult to handle extremely heavy cars successfully on 2.5 or 3 per cent grades, with the usual coefficient of friction or braking power.

I have also observed in handling such cars on heavy grades that the braking seemed to be much less effective toward the foot of the grade than at the summit, leading to the conclusion that there is a probable appreciable drop in the coefficient of friction due to continued rubbing. The question of the coefficient of friction is very important.

J. P. Young (Pennsylvania): Under the recommendations for the coefficient of friction, I would like to ask if the committee has considered the use of steel or steel-tired wheels in freight service. They have given a test for steel-tired wheels apparently to be used in passenger service only. I believe it would be advisable to have a test for steel wheels, or steel-tired wheels, used in freight service, at least corresponding in a measure to the cast-iron wheels for which they have given a specification. There are a number of steel wheels now being used in that service. The mention of steel



Joseph W. Taylor,  
Secretary, M. M. and M. C. B. Association.

opinion of the committee in my answers to questions. There is no question but that the coefficient of friction decreases as the shoe gets hot. The report proposes no specification under those circumstances, and I do not know that the results at the pressures proposed can be assumed to offer an indication of the relative standing of the shoe as regards the coefficient of friction under continuous application. It is a fact that the shoe which meets the specification at one or two pressures proposed, is very likely to meet them at the lesser and higher pressures, unless those lesser and higher pressures are far removed from the pressures represented in the tests.

Answering Mr. Young's criticism, that the pressure range is not carried sufficiently high in the tests on the steel wheel; it is my understanding that 6,840 represents severe freight conditions, and 12,000 the modern passenger conditions. There again, the shoe meeting 12,000 lbs. pressure will meet it at 18,000 lbs pressure. That is not always true, but insofar as it is true, it constitutes a defence of the committee's action in omitting a variety of pressures. It eliminated a number of the older pressures, as they were too close together to add any additional information; and the proposed change simpli-

fies the making of tests. There is no reason to believe that the coefficient of the rolled steel or steel-tired wheel would be materially different; and therefore it has not been thought necessary to differentiate or to use more terms.

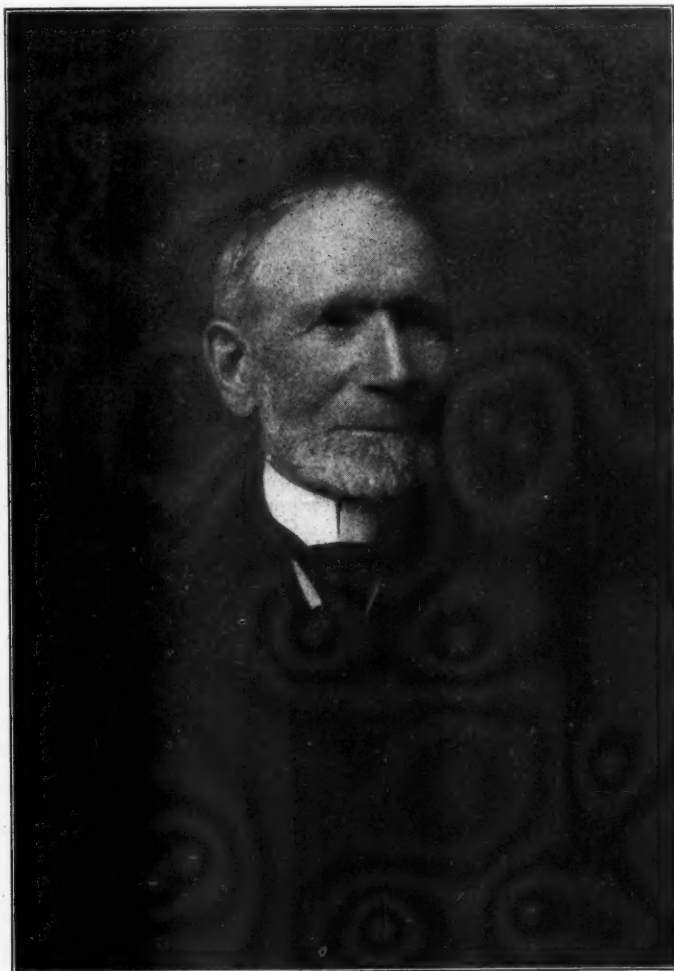
The President: The summary of the committee's conclusions, as far as brake shoes are concerned, is given in the report. They suggest new specifications for brake shoes to be substituted for our present standard specifications.

F. W. Brazier (N. Y. C. & H. R.): I move that the report of the committee, as far as it refers to brake shoes and its recommendations, be referred to letter ballot. The motion was carried.

Professor Schmidt: Referring to that part of the report referring to brake beams. If such a change in the current specifications appears to be desirable, it would result, probably, in a change of the specifications to read as follows: "Apply a test load of 6,500 lbs. and measure the deflection. The desired maximum deflection is .0625 in., and in its variation,

in other words, .0625, or .0627, or .0628 would be satisfactory. I have penciled a modification of this section so as to read: "Apply a test load of 6,500 lbs., and under this load measure the deflection, which is desired to be .0625 in., but shall not exceed 0.07 in." That would apply in the tests of both the No. 1 and No. 2 beams.

The third paragraph, under "a" and "b" for Beams No. 1 and No. 2 applies to all lots of beams of five hundred or less purchased, which would mean the testing to destruction of one beam in each lot, no matter what the size of the lot might be. If the lot is small, we may say we will waive the specification, or we will waive the whole specification. I believe it would be very much better if we would eliminate that sentence "Next load the beam until failure occurs," and say instead "If desired, the beam may then be loaded until failure occurs." That would make a destructive test optional instead of obligatory. Any road desiring it could put it in their specification.



John Kirby,  
Treasurer, M. C. B. Association.

1/100 or 5/1000 in. is allowed." That proposal was received by the committee too late to receive adequate attention, but Professor Goss desires to have it presented at this time for such consideration as you wish to give it.

The committee makes one more recommendation: "In concluding this report, the committee desires to express its opinion that if its recommendations be accepted, it considers its work to be finished for the present; and it suggests therefore that the committee, as a standing committee, be discontinued."

Mr. Seley: I have in mind an objection, which has been largely removed by the later remarks of Professor Schmidt, that was, the exact determination of deflection. We all know that the old idea of 1/16 in. was that it would cause undue piston travel by too much deflection of the beam, and I believe in early proposed specifications they started to put it at 1/32 in., but it was found that that would make an unduly stiff, expensive and heavy beam, and 1/16 in. was decided on. I do not believe these people had the idea of .0625, right down to the last figure beyond the decimal point;

It would seem to me that the amounts named under the destructive tests are a little high, I do not know very much about it, but it occurs to me with very high ultimate limits, we might lead manufacturers to the use of hard, brittle material, that would give results under test, but would not be desirable as a practical proposition for brake beam material, and it would seem that a factor of 3 to 1 on the test load would give a sufficiently high amount. I would like to make a motion that the recommendation of the committee regarding the expression of the deflection and also the necessity for the destructive testing of the beam being obligatory, be changed as I have quoted in my remarks.

There is one thing more, I do not understand the date under recommendation 4, "After January 1, 1908." I think that must be an error.

Professor Schmidt: That is an error, but I do not know that I can explain fully the reasons on which the date is determined.

T. H. Curtis (L. & N.): Were tests made looking to any specification for the transverse strength of the brake-beam?

Professor Schmidt: There were no tests made in connection with this report, concerning the strength of the beam other than in the line of pull.

Mr. Seley's motion, which provided that the report of the committee be amended and submitted to letter ballot, the amendment consisting in a slight additional allowance in deflection and making destructive tests optional was carried.

In the absence of A. Kearney (N. & W.), the secretary read the report of the committee on Rules for Loading Materials.

#### RULES FOR LOADING MATERIAL.

While the report of the Committee on Revision of Rules for Loading Material involves several recommendations for changes, still the idea throughout has been to adhere as closely as possible to the rules as they now exist, making only such additions, corrections and omissions as would, in the opinion of the committee, conduce to greater unity, better sequence, and a natural clearness—principles so necessary in formulating rules of this character.

Hence, in presenting this report to the Association, we deem it wise, in order not to take up too much time and yet make it possible to bring to your minds the main points to be considered in our revision, to mention here only such rules as have received radical changes, giving our reasons therefor, with the understanding that there are quite a number not contained in this synopsis, which, by reason of a slight change in construction or phraseology, are none the less important in strengthening the rules in their entirety.



A. Kearney.

As a general prelude to all the recommendations which follow, we are uniform in our opinion in strongly urging that the cuts in the next edition of the Code of Rules for Loading Material be enlarged, as we find several of these cuts very indistinct, on account of the great reduction in size, and we consider there is ample opportunity to make them very much more distinct.

Since Rules 12 and 34 are co-related in a way, in that the former governs the size of stakes for general loading on both flat and gondola cars, while the latter refers to staking and tying of same for lumber loaded on single cars, it has been thought advisable to mention them here together, although in the rules they follow in the natural order.

In rule 12 the use of hemlock for staking has been extended to include not only single loads of sawed lumber, but also loading of tan bark and slab wood; besides, hemlock may be used for blocking and chocking any load. In this rule, as well as throughout them all, the size of nails for tie boards has been reduced from 16-penny to 10-penny.

In Rule 34, governing single loads of lumber, the size of tie boards has been reduced from 1 by 5 inches to 1 by 4 inches, the size of nails, as mentioned above, has been put at 10-penny, and the number of wrappings of wire reduced from six to four strands. The size of stakes for loads in one or more piles, Section B, Rule 34, has also been somewhat reduced, and a new table of substitutes for each pair of 3 by 2 inch stakes, hardwood and hemlock, has been added, to agree with the reductions in stake sizes made in Section B.

Attention is also called to the fact, that, notwithstanding the slight reduction in sizes of tie boards and number of

wire wrappings for tying stakes, as outlined in Rule 34, governing loading of lumber on single cars, the point is distinctly made that for overhanging loads of lumber, loading must be in accordance with Rule 13, which requires 1 by 5 inch tie boards, instead of reduced size 1 by 4 inches, allowable in Rule 34 for single loads of lumber also a greater number of wire wrappings is necessary when substituting for tie boards on loads of this character, six instead of four strands, being used as required under Rule 34.

The next recommendation we would call to your attention is the addition we have made to Rule 15-C, which refers to the restriction of height of superimposed load with respect to the center of gravity. The addition recommended is as follows: "For loads on top of sides of gondola cars the distance from top of rail to center of load, measured at bearing prices, must not exceed 9 feet 3 inches."

The question has received a great deal of discussion pro and con for some time, but since it was the opinion of the majority of the committee that considerable changes have taken place in railroad equipment recently, and that roads were now in better shape to handle such a restriction, this change was decided upon.

L. H. Turner, of the Pittsburgh & Lake Erie, representing the New York Central Lines as well, here puts himself on record as being directly opposed to this change, for the reason that sufficient low-side cars to make the ruling fair to all concerned are not obtainable. However, the majority of the committee are in favor of showing in the rules the figures 9 feet 3 inches as a limitation for the center of gravity, for such loading, and, therefore, it is included.

Quite as important, as well as decided, a step as has been taken in this revision is the recommendation that we change Rule 26, permitting discretionary use of either hardwood or metal spacing blocks, to the exclusive use of metal spacing blocks, striking out all reference to hardwood spacing blocks. The consensus of opinion of the majority present at the meeting seemed to be that the hardwood blocks are unsatisfactory; but right here, we are aware that if metal spacing blocks are adopted, some change will have to be made in the Code of Rules Governing Interchange, to protect metal blocks thus employed, and we offer as a suggestion that such protection be handled in the same way as chains are now taken care of in the Rules of Interchange.

C. E. Fuller, of the Union Pacific, and W. Moir, of the Northern Pacific, both of whom were unavoidably detained from attending the preliminary meeting for discussion of such changes as in the opinion of the committee would be necessary, together with A. Stewart, of the Southern Ry., who as present, have since asserted themselves as being directly opposed to any disturbance of the present ruling. Mr. Fuller believes that metal blocks should not be used exclusively until the matter has been more thoroughly canvassed and an expression from the majority of the trunk lines obtained, while Mr. Moir is positive in his opinion that the exclusive use of metal spacing blocks should not be required. Mr. Stewart compromises in suggesting the use of metal spacing blocks for tandem loads where metal material of large shape is the lading, allowing hardwood spacing blocks for tandem loads in the timber districts where long timber is the lading. Therefore, the committee stands equally divided on this point; but, inasmuch as at the meeting there seemed to be a clear majority in favor of restricting the use of metal blocks, we have drafted it, leaving out all reference to hardwood blocks, and herewith present it, together with the balance of the rules, for your consideration, and for whatever action you deem should be taken. Rule 26 now reads: "The cars must be jacked apart by placing one jack on each side of coupler, separating the cars until the couplers are pulled out to the fullest extent, inserting metal blocks to completely fill the space between horns of coupler and end of sill and coupler release rod chain disconnected, as shown in Figs. 2 and 3."

This brings us to the "Rules for Loading Pipe on Open Cars," Rules 112-117. It has been thought advisable to change these rules materially, and they have been reduced from six general rules to three with sub-divisions, care being exercised to break them up so that the various sizes and kinds of pipe should follow each other in natural order. With this end in view, general instructions with respect to wiring and staking for both classes of open cars, flat and gondola, and for all sizes and kinds of pipe, act as an introduction to the rules, while from this there follow the instructions for loading first on gondola, then on flat cars. The main point we would call your attention to in the revision of this particular set of rules is the change of compulsory facing of bell or sleeve ends of pipe toward center of car, leaving the direction these ends must point to the discretion of the loader.

The next decided revision contained in our recommenda-

tion has to do with the "Rules for Loading Stone, Brick, etc., on Open Cars." Here we have preserved the same number of general divisions as before, but have added two subdivisions and have given marginal sub-headings to some of the main rules in order to classify the various kinds and sizes of this lading readily. We have attempted in this revision to cover the loading of this kind of lading not only in a thoroughly systematic way, but at the same time to comply with the best practices as observed by the shippers, and the rules now formulated are the result of personal contact and experience with the methods employed by some of the largest producers and shippers of stone.

The heading at top of page 106, beginning, "Rules Governing Loading of Scrap Junk and Similar Material on Cars fitted with Racks," has been changed, inasmuch as light scrap and junk are often carried on either open cars or cars fitted with racks, and the rules now read: "Rules Governing Loading of Scrap, Junk and Similar Material on Open Cars With or Without Racks." A figure illustrating the application of such racks follows the rule governing the loading of this lading.

The final recommendation for change of any importance in the rules is the one under the heading of "Rules Governing Loading Material in Box or Stock Cars Where the Opportunity Is Provided for Inspection." Deeming it wise when dealing with any set of rules covering a particular kind of loading, we have incorporated as the first rule under this heading general instructions with respect to inside loading in closed cars, together with requirements for door and open-door protection. In this way we have made the new Rule 124 a general one, from which there follows the loading of various kinds of lading contained under this heading and contained in the Rules 125-132, inclusive.

The loading of barrel staves, fence posts, wooden b'ilets, lath, tan bark and similar short wood has been comprised in new Rule 126, which is a combination of old Rules 125 and 129, with reference to loading of ties and switch timber stricken out, which material is covered in new Rule 127.

The principal change in old Rule 127 is its new number 129, together with the suggestion that in loading car wheels, they should be laid flat with flanges face upward, to facilitate unloading.

New Rule 130 is practically the same as old Rule 130, while old Rule 131 has been incorporated in general instructions with respect to inside loading, new Rule 124 thereby eliminating old Rule 131, whose place is taken by new Rule 131, on the subject of scrap junk material loaded in stock cars, being taken care of and not allowed to pass through spaces between the slats.

This brings us to new Rule 132, covering the loading of sewer pipe, drain tile, etc., in closed cars. There is very little difference between this new rule and its old predecessor, Rule 133, on the same subject.

Here we feel that we should make some comment upon the present Rule No. 6, which some time ago was referred to by Mr. Delano, President of the American Railway Association, suggesting that some modifications of this rule be made to make it harmonize with Rule No. 15 of the American Railway Association. In a letter to F. H. Clark, President of the M. C. B. Association, Mr. Delano suggested that Rule No. 6, of the Rules for Loading Material, should be modified to harmonize with the spirit of the times in the way of increasing the movement of cars in interchange. The letter was referred to us for consideration.

Rule No. 6 of the Rules for Loading Materials reads:

"The height and width of lading must be governed by the clearance limits of the roads over which the lading is to pass." The section of Rule No. 15 of American Railway Association, to which we are inclined to believe reference was made, is "d," showing conditions for which receiving road should pay cost of transfer, and reads: "When cars exceed load limit or can not pass clearances or be moved through on account of any other disability of receiving line, the receiving road shall pay cost of transfer."

The principle of Rule No. 6 was to impose, as far as possible, upon the loader the duty or responsibility of ascertaining the clearance limits on the roads over which lading was to pass, in order to avoid any subsequent cost for readjustment, but it was not within the province of Rule No. 6 to legislate as to who should assume responsibility in cases where transfer or readjustment of load is necessary. In other words, the provisions of the rule serve merely to point out physical requirements of load.

The fundamental principle of section "d," Rule 15, American Association, as we view it, is to impose the responsibility of transferring or adjusting load on the road the car reaches that has such a disability.

Failing to see why the loader of any material should not observe some limitation of clearance, which might be done

economically, it being profitable to load within some convenient limitation at no additional cost, or loss in revenue tonnage, and as a compromise to the situation, rather than strike out Rule No. 6 entirely, the idea was suggested of substituting in lieu thereof a rule directing the attention of the parties loading to observe the limits of the standard box car as adopted by the American Railway Association. You will observe, however, we have made no change in the present Rule No. 6, although we had thought that it might be expedient to decide upon some average limitation of load. Upon this assumption, we had labored under the impression that the dimensions of the American Railway Association standard box car would give us just what was wanted, but in this we failed to get relief, because the limits of this standard are for inside measurements only. Hence, we are not leading up to any relief if the opinion still prevails that there is a conflict between Rules 6 and 15.

As a general proposition, it would seem, however, to be good business to load material within certain limitations, which would cause the least interference at the different junction points, and at the same time give us an economical bulk of lading. Therefore, this might point to the advisability of naming, or getting a committee to name, some limitations which can be used in our rules. This question is, therefore, laid before you for your consideration.

Again, your committee has received a letter from Jos. W. Taylor, Secretary, M. C. B. Association, dated May 7, 1910, advising that the Arbitration Committee contemplates suggesting in its report to the convention that the American Railway Association rules for Handling of Explosives and Inflammables and also the M. C. B. requirements regarding tank cars be made a part of the Rules for Loading Material, and that the three sets of rules be incorporated in the Rules of Interchange. The committee has had very little opportunity to consider the proposition; in fact, the information reached us some time after our last meeting, and for that reason we feel we have been unable to ascertain fully the motive prompting the suggestion.

From one standpoint, there might be something gained, in that the rules governing the physical condition of cars, as well as the correct and safe loading of same, would all be confined under one cover, but still it impresses us that a book large enough to carry all data so combined would not only be larger than anticipated, but at the same time the portion covering the Rules of Interchange would be referred to many times during the day, while the Rules for Loading Material would not be used so often, and those for handling Inflammables and Explosives would come into practice comparatively quite infrequently.

Doubtless, many are familiar with the very pertinent references made to this proposition which were brought out in a recent discussion at the Western Railway Club. The drift of the argument rather pointed to a manifest difference in the treatment of the physical condition of cars as taken care of by the Rules of Interchange, as compared to security in methods of building up loadings contained in the Rules for Loading Material.

Still, if the chairman is allowed to express his individual opinion, in the absence of opportunity to discuss with the committee, he really can not see that the cover or binding should in any way affect the force of the rules, because, if the Rules for Loading Material as well as the other two groups of rules referred to are standards of the Association they should be equally observed, whether printed separately or in any combine form—the fact of combining them should not necessarily influence their value and the recognition they should be given.

Before concluding, the committee feels constrained to point out a disadvantage under which it is oftentimes laboring in its endeavor to put the Rules for Loading Material in the best and most desirable shape for all concerned.

It is reasonable to suppose that physical conditions and requirements bring up problems locally which are met by excellent suggestions for changes in the rules. Some may be of minor importance, while again others are of considerable moment. These oftentimes valuable remedies seldom reach us, hence, we refer to the disadvantage, because the committee, less posted, perhaps, in some local situations, is endeavoring to make general and specific rules for the guidance to all.

Occasionally, the secretary will forward the committee a communication—sometimes for the interpretation of the rules covering a particular point, and again for the method of loading a particular commodity, but we are not reaping the benefit of the many good ideas arising in handling commodities under local conditions, which knowledge would tend greatly to increase the efficiency of the committee. We are only endeavoring to bring about a plan by which your committee can derive the benefit of the broader experience, so

that the rules will be still further increased in their efficiency and integrity.

The report is signed by:—A. Kearney (N. & W.), chairman; C. E. Fuller (U. P.), A. Stewart (Southern), W. Moir (N. P.), J. S. Lentz (Lehigh), W. F. Kiesel, (P. R. R.) and L. H. Turner (P. & L. E.).

W. L. Russell (P. & R.): I move the report of the committee be accepted and referred to letter ballot, after the convention has taken such action as to strike out that portion referring to the height of superimposed loads, and also that part of the report requiring the use of metal spacing blocks exclusively, for the reason that the part of the committee proposing those suggestions has given good reasons why they should not be adopted.

In looking into the matter, we find that of the number of cars with low sides to permit such loadings, the Pennsylvania System owns 21,000 cars with 30 in. sides of 100,000 lbs. capacity; the New York Central owns 3,850 of the same type of cars; the Erie owns 1,000; the Baltimore & Ohio owns 3,006; the Philadelphia & Reading owns 500; the B. R. & P. owns 250. If the proposed change is adopted, it makes the height of loading 9 ft. 3 in. from the top of the rail to the centre of the load, and that will legislate out of service for this kind of loading 266,863 cars with 40 in. top sides and higher. Those cars are owned by various roads throughout the country outside of the Pennsylvania system. In obtaining further information on this subject, I had advice from the traffic manager of the Carnegie Steel Company, that they have had as high as one million dollars worth of finished products on their floors at one time awaiting cars for loading. If this proposed change is made, it will work as great a hardship on the manufacturer as it does upon the railways. With these conditions before us, I do not think this convention will agree to such a radical change in the rules at this time. It has been said by the committee that it finds the railways better able to take care of superimposed loads of 9 ft. 3 in. centre of gravity than heretofore. That is true, but it is not so to the extent required. For that reason, I think that part of the report should be stricken out.

As to the metal-spacing blocks, it has been the desire of all railways and their managers to facilitate the movement of freight. If we adopt the rule requiring railways to use metal-spacing blocks instead of wooden ones in certain cases, we will restrict the freight movement further; and for that reason I move that those two clauses be stricken out.

Julius Krause (P. R. R.): When you get the center of gravity up so high, and run over curves with six and seven inches elevation, and you are not running very fast, you are getting a lot of weight on the side-bearing on the low side of the car; and then you want to look out for trouble. Now, as to the wooden spacing block; we have had a lot of trouble during the last few years with those blocks; as our cars and engines have grown in size, the wooden spacing block does not do. I have had to renew them as high as three times in twenty-five miles. You may ask why didn't I let them run? Well, you place your lading seven-tenths between the bearings and three-tenths over, and strike a curve, and what is the result? The wooden spacing block will squash and your load begins to creep one inch at a time, but if it creeps ten times in a minute, it don't take long to spill. I have had two instances in three months where a good wooden car was so badly overloaded that it has broken down.

J. J. Tatum (B. & O.): I have a great deal of sympathy with my friend, Mr. Krause, for I have shared troubles with him; but I do not believe in increasing the troubles; and by this addition to the rules, we are getting more. I think the trouble, instead of being with the center of gravity of the superimposed load being placed above 9 feet 3 inches has been that we have not loaded cars according to the rules adopted by the Association to safely retain the load on the cars. We have investigated this matter very carefully, and we find we have had trouble with but one load, and that was not secured to the car in accordance with the rules of loading long material.

J. J. Hennessey (C. M. & St. P.): It seems to me that in putting the center of gravity at 9 feet 3 inches we are taking a step backwards. We have run under the rules of loading long material for a long time, and I have not heard of a serious accident. Certain roads are unfortunate enough to have such sharp curves and such poor tracks that they cannot carry a load beyond a certain height, but for that shortcoming the roads of the country should not be punished. The pressure on us is to keep cars moving; suppose we establish this height of 9 feet 3 inches, and a car comes to some point of interchange, and is one inch above the established center of gravity, you will have the car held up. I do not think we should go on record as being in favor of any such a proposition as that. I see no necessity for it in the rules to-day; and I move that that portion of the rules be stricken out.

S. Lynn (P. & L. E.): I am from a Pittsburgh district, and we know we are hauling loads higher than the limit proposed in this rule; but we are handling them successfully. I do not think this convention should place a limit on the height of the load. I am in favor of the metal spacing block. It is a good thing.

I. S. Downing (L. S. & M. S.): The Lake Shore gets the bulk of the material loaded on top of the high side coal cars from the Pittsburgh district. I do not recall, in an experience of eighteen years, ever having had an accident on account of such lading. The lading is joined in the center of the cars. I think a wooden block reinforced with iron is better than a cast iron block that may break in two. I do not think we should go to metal-spacing blocks for that reason.

Mr. Schroyer: How do you reinforce the wooden blocks, with angle irons?

Mr. Downing: At the corner.

E. A. Miller (N. C. & St. L.): Before this matter goes to a vote I wish to say that I feel it would be unfortunate should the recommendation carry. Ours is only a small road, and we have built in the last few years a large number of gondola cars, especially for the steel trade. Our first gondolas for that trade were low-side cars. We afterwards built a gondola that was 87 in. from the top of the rail to the top of the box. We reduced that on our next lot of gondola cars to 81 in. from top of rail to top of box. We have known of no trouble on our own road, and we have heard of no trouble with these cars on adjacent lines or the lines with which we do business.

The President: Mr. Tatum's motion was that the proposed change in Rule 15-C be eliminated, the modification of Rule 26 be eliminated and the remainder of the recommendation be submitted to letter ballot.

Mr. Tatum: The motion in substance was that the report of the committee be accepted with the elimination of the reference to the rule fixing the center of gravity at 9 ft. 3 in., and the elimination of the reference to the spacing block.

The motion was carried.

The President: If there is no further discussion on the report, it will be referred to letter ballot.

#### MR. HOOLEY ON THE EMSEEBEE ASSOCIATION.

"What be thim Emseebees?" inquired Mr. Dennissey on the morn'ing of the arrival of himself and his friend Mr. Hooley at Atlantic City. "Ye towld me about th' McHannix clan 'nd sid th' R'yal Grand Lodge av Emseebees 'd be wit' 'em, 'nd they are, but what they be, I dinna'w."

"Nayther do I," replied Mr. Hooley.

"Ye don't know!" ejaculated Mr. Dennissey in some astonishment, as this was the first time he had ever heard an admission of ignorance on the part of his friend. "Iv ye don't know what they are, there a'n't anny."

"That's th' answer, Dinnissey. They a'n't anny," replied Mr. Hooley. "They's a R'yal Grand Lodge av Emseebees, cr th' Emseebee Assocyation, 's they carl thimsilves, but they a'n't anny Emseebees no more. They may be tin or twilve arl together, iv ye rake th' Shtates 'nd Canady 'nd Mixico, but th' gr-reat glory av th' assocyation is that they a'n't anny more Emseebees in th' assocyation that th' Emseebees made."

"Wull ye exhplain that?" asked Mr. Dennissey in some perplexity.

"I wull so," said Mr. Hooley. "'Tis this way, Dinnissey. 'Tis like th' Dimmycratic pairty, 'nd th' Raypublican pairty, tco, f'r that matter. Ye say, th' Dimmycrats was arl Raypublicans whin th' pairty was begun—about th' time ye was a gcssoon on th' owld sod—'nd th' Raypublicans was arl Wigz—"

"Th' gintry arl wore wigs in thim days, I'm towld," remarked Mr. Dennissey thoughtfully.

"Ye'er powers av hearin' 'nd undherstandin' 's gettin' no better very fast, I persave," moaned Mr. Hooley. "I sid Wigs, not wigs—big double-ye, haitch, high, gee, Wig, iv ye can shpill an aisy wurrd. 'Tis th' name av th' pairty that was before they was anny Raypublicans. I dinna'w jist now why they changed th' names, 'nllss 'twas that they got howld av some man that nayther pairty cud shtand, like Brine, f'r instance, 'nd 'twas thought that be th' change av name they cud get rid av th' man aisier than th' prisint Dimmycratic pairty's been able to get rid av Brine, or th' Raypublican pairty av Rosyvelt. 'Twud be a good thing, I'm thinkin'."

Dinnissey, iv th' names av bote pairties cud be changed agin," mused Mr. Hooley thoughtfully.

"'Tis an entertainment' historical 'nd pollytickle lecture ye're givin' me," remarked Mr. Dinnissey, "but me comprehension's not that quick t' till me what it's arl got to do wit' th' Emseebees."

"'Twas merely an illustration, Dinnissey, not to be t'rowin' anny bokays at ye'er powers av comprehension, ayther," retorted Mr. Hooley. "I sid they was now only about tin or twilve av thim, but I mind me now that me frind Ta-aylor, he's th' sicriturary av th' assocoyation, towld me they was about sixty av thim in th' Shtates, countin' in Canady 'nd Mixico, but they was only tin or twilve owld-fashioned relrods that hadn't changed th' name to somethin' else. Some av th' roads has siv'ral av thim. That laves about sivin hundred mimbers av th' assocoyation that carls thimsilves by another name 'nd smills av swate, 's th' pote says, against liss than sixty Emseebees. 'Tis a fine wurrkin' majority, I'm thinkin', Dinnissey."

"'Tis about th' same majority as wurrked ye in th' warrd th' last 'llection, 's I raymimber," interjected Mr. Dinnissey.

"We're not in th' warrd now, 'nd we're not convairsin' on pollytickle subjicks," returned Mr. Hooley with some warmth. "'Tis thryin' I am to bring to th' livil av ye'er comprehension th' illuminatin' fact that th' bigger 'nd shtronger th' Emseebee Assocoyation gets, th' liss Emseebees they is in it. They're arl shuperintindints av locommytive power, 'nd shuperintindints av rowlin' shtock—though f'r me pairt I dinnaw anny shtock that rowls axcipt harses 'nd pigs, 'nd they a'n't anny room f'r thim to rowl in th' shtock cars, anny that I've iver seen, annyhow—'nd thin they's th' foremin av car repairs, 'nd a lot av th' McHannixes. Th' bosses av th' assocoyation in th' owld times lit arl these min int' th' assocoyation t' swill th' vote at th' primaries, as ye might say, Dinnissey, iv we was talkin' pollytics, 'nd didn't shtop to think that arl th' shuperintindints av locommytive power 'nd arl th' McHannixes were mimbers av th' McHannix clan. 'Nd thin th' relrods thimsilves that didn't take anny intrust in ayther th' assocoyation or th' McHannixes was inflooned to carl their Emseebees assistant shuperintindints av locommytive power, 'nd McHannix in charge av rowlin' shtock, 'nd gin'ral foremin, 'nd th' like av that, 'nd that kipt thim fr'm thinkin' that th' R'yal Grand Lodge av Emseebees was th' whole thing. Iv ye belong to th' Ancient Ordher 'nd to th' Knights av Brine Boroo, bote, ye're goin' to be nootral whin they's conflictin' intrusts bechune th' two av thim, a'n't ye, Dinnissey?"

"I voted f'r Brine th' lasht time, 'nd ye didn't carl me no names, nayther," answered Mr. Dinnissey somewhat reproachfully. "What d'ye say his other name was?"

"I'm shpakin' av Brine Boroo, th' gr-reatest king Ireland iver had, rist his sowl f'r th' last tin hundred years, 'nd not av th' rimnant av th' Dimmycratic pairty that was. But 'tis no matther. Ye see, Dinnissey, th' Emseebees 'nd th' McHannixes 've got so mixed up 'nd th' relrods a'n't makin' anny more Emseebees, they're thinkin' av makin' a thrust out av th' two av thim. They've appointed commytees av th' assocoyation 'nd th' clan t' consider th' matther av th' thrust 'nd rinder an imparshall rayport to bote th' convintions th' year that is. 'Tis an illigant jint commytee. Av th' six mimbers av th' two commytees, they's four shuperintindints av locommytive power that is, 'nd wan that was, 'nd wan shuperintindint av th' car departmint. Whin they make their rayport, it'll be signed by thim six min, 'nd how owld is Ann?"

"They's wan thing, though, that may hilp th' Emseebees whin it comes to a vote whither th' locommytive shall go first or back up," added Mr. Hooley thoughtfully. "They're littin' a lot av car inshpectors become mimbers av th' Emseebee Assocoyation. They're min av gr-reat infloence."

"What do car inshpectors do?" inquired Mr. Dinnissey.

"Pick off th' buds av th' grane lumber in freight car sills

whin th' cars pass th' intherchange points," replied Mr. Hooley, knocking the ashes from his pipe and moving up the Bcardwalk.

## Conventionalities.

On account of business responsibilities George H. Forsyth, president Forsyth Brothers Company, is not attending the conventions this year.

Wanted—A pitcher or a battery. It is understood that the Western team is in the market for a pitcher or a battery to play in the game on Saturday.

The U. S. Metal hat has again loomed out of the mists and the genial Dunham is once again walking the planks. Let the band proceed. Sombrero grande!

Most men carry their checks in a book. One man carries his in his head. Guess—or blink at Stafford's cap. It certainly is "an abomination unto the Lord."

George T. Anderson, mechanical superintendent of the Whipple Car Company, accompanied by Mrs. Anderson, arrived Monday. They are at the Chalfonte.

George A. Cooper, of Detroit, Mich., arrived Sunday and is at the Marlborough-Blenheim. George has a sure thing on the heavy weight "pug" celebration at San Francisco. Ask him.

Mr. and Mrs. John D. Hurley, of Chicago, got here Monday. Jack never knocks, and yet it is believed that if properly approached he could produce a supply of Thor hammers on short notice.

J. E. Minor and Mrs. Minor appeared on Tuesday. Mr. Minor is one of the earliest and most faithful attendants at these coventions, and has served his fellowmen in several important committee positions.

Mr. and Mrs. Stanley W. Midgley arrived from Chicago Monday evening. They have not missed an M. C. B. and M. Convention for the past eight years. Mr. Midgley represents the Curtain Supply Company.

It sure does seem like old times when you get the glad hand from Scott Blewett. His ready smile and always pleasant words give one that kind of inspiration that dispels all thought of burden in one's daily work.

Choose your partners for the Military Euchre. It is promised to be the event of the convention season, and 1,000 volunteers are wanted to storm the numerous forts which will be provided. It comes on Friday evening.

A William Sellers & Company (Inc.) party, consisting of Strickland L. Kneass, Mrs. Kneass, C. B. Conger and John B. McClintock, came over from Philadelphia on Monday in what Conger designates a "gasolene buggy."

D. F. Jennings, of Chicago, came ahead of the conventions. He has not yet fairly opened up his line of talk on Guilford S. Wood's "Railway Necessities," but he brought along a good supply of fish stories with which to fill in the first few days.

Robert F. Carr, president of the Dearborn Drug and Chemical Works, is unable to get to the convention this year, as he is spending a couple of months in Europe. He will attend the International Railway Congress, to be held at Berne, Switzerland, next month.

George R. Carr, vice-president of the Dearborn Drug & Chemical Works, accompanied by his mother, Mrs. E. A. Carr, reached Atlantic City on the Pennsylvania Limited from Chicago Tuesday evening. They are quartered at the Marlborough-Blenheim.

B. A. Hegeman, Jr., president of the U. S. Metal & Manufacturing Company, is on hand, as usual. He is accompanied by his son, Harold A. Hegeman, who is making his debut as a railway salesman. Harold H. sure looks like he's "a chip of the old block."

James T. Milner, vice-president of the Standard Car Truck Company, arrived from Chicago Tuesday. Mr. and Mrs. Milner have just returned from a pleasant trip to foreign lands, having visited England, Ireland, Belgium and witnessed the Passion Play at Oberammergau.

Mr. and Mrs. A. L. Whipple, and their three children and maid, reached Atlantic City Tuesday. "Whip" is a busy man at these conventions. He made a "bee line" from the station to the Million Dollar Pier and at once plunged into the work of the executive committee, of which he is a member.

The many friends of George E. Van Woert will miss his presence this year. Mr. Van Woert died April 14 at his home in Chicago. For twenty-five years he held positions of responsibility with the Murphy Varnish Company, and for the last twenty years was its honored and trusted manager in Chicago.

Once in the year Harry C. Buboup transfers his affections from Chicago and the Grand Pacific and smiles upon the convention attendants. He is here, and it is suspected upon this evidence alone that J. J. McCarthy is somewhere in hiding—possibly under some kind of a car roof that does not leak.

J. Will Johnson, the hustling chairman of the entertainment committee, has been on the ground—so far as the pier and the Boardwalk may be called ground—for about a week, arranging the details of the numerous functions in his charge. His work has been so far perfected as to permit of his being joined by Mrs. Johnson, who arrived on Sunday.

Among the familiar faces at the convention is that of Thomas E. Carliss, one of the veterans of the metal brake beam business. Mr. Carliss recently resigned his position as superintendent of the Chicago Railway Equipment Company's Jersey City plant, to take the position of manager of the manufacturing department of the Buffalo Brake Beam Company.

Among those whose presence will be missed this year at the conventions is William M. Simpson, of the Railway Materials Company. Mr. and Mrs. Simpson left Chicago last week on a rather extended European trip. Among other interesting events on their program, they will attend the International Railway Congress at Berne.

J. F. Walsh appears at the convention this year with the title of general superintendent of motive power. Up to the present his jurisdiction includes only the lines of the Chesapeake & Ohio; but each of the general superintendents of the three grand divisions of the road has been given a superintendent of motive power reporting to Mr. Walsh.

Frederic Parker, vice-president of the Hunt-Spiller Manufacturing Corporation, is again in attendance at the convention. Mr. Parker's other interests allow him to give very little personal attention to the affairs of the corporation; but he thoroughly enjoys coming to the conventions. As this is the fourth or fifth one he has attended, his circle of acquaintance is naturally growing some.

Mark A. Ross and Mrs. Ross were among the early arrivals on Monday, and both of them are as brightly beaming as one of Moxie's headlights. Perhaps it is that the duties of chairman of the Entertainment Committee which Moxie performed so well a few years ago have been shucked off upon the broad shoulders of J. Will Johnson, Moxie's chief assistant in business.

The man who read the sign over an optician's shop on the Boardwalk, "1421 Eyes Examined Free," was filled with a consuming curiosity as to the mental characteristics of the one-eyed man who must have been included in the number who had thought it worth while to have "it" examined. It finally dawned upon the observer that 1421 was the Boardwalk number of the optician's shop.

No, the pergola-like structures on each side of the ball room were not erected solely for the purpose of herding dancers within narrower limits, nor for the purpose of affording more sitting room for the goats and others. The fact is, that the immensity of the exhibit this year required all the available space—and then some. A part of the space annexed and segregated, as it were, is that on each side of the ball room at the inner end; and by the new arrangement this becomes a part of the space under the galleries.

The multitude of friends of Fred. A. Casey, who appeared at the conventions last year showing plainly the results of a serious railway accident, will be glad to learn that his condition is much improved, though on account of internal injuries he has fears that it may be a year or more before he is fully recovered. The patience and cheerfulness under conditions of suffering in the case of one heretofore so active for the common welfare and happiness, as Mr. Casey has always been, are an inspiration in themselves and an everlasting rebuke to such as find the world an excuse for an eternal frown upon the brow and a grouch in every pocket.

J. W. Griffith, purchasing agent of the Union Pacific, spent Wednesday on the pier greeting his friends and absorbing some of the good that the splendid exhibit affords. Mr. Griffith is at the Marlborough-Blenheim and will leave for Omaha some time to-day.

J. A. Kinkead, New York representative of the Parkesburg Iron Company, has reverted to his old habits of testing materials. At present he is testing lemonade.

George E. Pratt, vice-president of the Crawford Locomotive and Car Company, is receiving the congratulations of his friends and former customers on his return to the car-building field. Mr. Pratt arrived in Atlantic City Wednesday.

Rosser has started out again this year as a bird tamer. He says he's got them so that they now eat out of his hand.

Poste may have happened in the nick of time; but we're not so sure about this title to fame as a physiologist. The editor who received the first and second calls (with emphasis on the "second") prefers to believe that Poste's psychological.

The system that has enabled the Railway Supply Manufacturers' Association to bring to Atlantic City, for one night, an all-star vaudeville bill, with a car load of scenery, properties, electrical effects and so forth, is that of the United Booking Offices of America. It provides the entertainment for the night of June 18, as well as the special matinees for the week. It is the "hub of the wheel" which books all the first class vaudeville houses in the United States, Canada, England, France and Germany. It is affiliated with the Orpheum circuit in the West and the Barresford tour in England.

Daniel M. Brady, who is entitled to rank among the old-timers if anyone is, came down on Tuesday on the New York special. His name appears to have been omitted from the list published on Wednesday morning, though it is not known how even his modesty made him successful in eluding observation. Its probably up to Vought—and Vought's up to us.

Mr. and Mrs. Burton W. Mudge and Master Burton W. Mudge, Jr., arrived from Chicago Wednesday and are at the Brighton. "Junior" Mudge, as some of his Chicago playmates call him, is aged 7 years and may some time succeed his grandfather as president of the Chicago, Rock Island & Pacific. His father is president of Burton W. Mudge & Company.

J. H. Smythe, formerly with the American Locomotive Company, is now with the Parkesburg Iron Company as boiler expert. He is a well-known figure at the conventions of the International Master Boiler Makers, and is enjoying the present meeting to his full extent of six feet four.

"Doc" Bateman, of the Parkesburg Iron Company, has changed his face but not his facility in welcoming old friends at the convention.

Heap Big Johnson is neither an editor nor a proofreader, as any person with but one eye could readily see, without squinting, if he were to wander through the Entertainment Committee's blue book; but he handed one to the scrap-basket editor's proofreader all right. Between them they coined the word "submittes" in Wednesday's *Daily*. Both still lay it to the hoodoo thirteen.

William H. Thomas, formerly of the Southern Railway, and C. H. Cory, formerly of the Cincinnati, Hamilton & Dayton, both life members of the Master Car Builders' Association and both retired, have come to be known among their familiar friends as "those heavenly twins." If one of them appears it is safe to lay a wager of considerable amount that the other is not many feet distant. Members of both associations hope that this pleasant companionship will be continued for many years.

Mr. and Mrs. Walter Macleod, Cincinnati, accompanied by Master Edward Macleod, aged 4 years, are attending the conventions and enjoying the pleasures of Atlantic City. Master Edward is a bright little chap who, like his father, possesses a decided mechanical turn of mind. Mr. Macleod is president of Walter Macleod & Company.

C. A. Dunkelberg, treasurer of S. F. Bowser & Company, and a member of the Entertainment Committee of the Railway Supply Manufacturers' Association, arrived from his home in Fort Wayne, Ind., in time for the opening session. Mr. Dunkelberg is a most willing worker in the affairs of the association and contributed considerable of his time last year to the welfare of all.

The discussion on roof boards in the Wednesday morning session was aptly emphasized by Mr. Schroyer. Mr. Hennessey was contending that, as the board roof was rapidly becoming obsolete, it was unnecessary to specify a certain width of board to be used for this purpose, and that a narrower board was strong enough. Under the weight of Mr. Hennessey's argument, Mr. Schroyer's chair broke under him. He contented himself with remarking, "This chair is built like some cars I know of"—and the subject was changed.

William McWood, member of the Master Car Builders' Association since 1875, life member and past president with three terms to his credit as presiding officer, still maintains

his interest in the work sufficiently to come to the conventions. His last term was 20 years ago.

Thomas Madill, Chicago manager of the Sherwin-Williams Company, one of the "Old Guard," is in attendance as usual.

John S. Lentz, member of the Master Car Builders' Association since 1879, a past president and one of those still retaining the original title of master car builder, appeared among his friends on Tuesday. He holds the representative membership for the over 52,000 cars of the Lehigh Valley; and though he says "there are only a few of us left," we all hope to see him among us for many years yet.

Having lost his umbrella several years ago at Saratoga, John Chamberlin did not venture to appear on the pier until Tuesday, when the skies were comparatively clear and pleasant weather might reasonably be expected. Have you seen the cane, though? Its delicate, ladylike taper is a wonder.

A. E. Manchester appears younger and stronger than ever since he has been able to turn over a part of his heavy duties upon the shoulders of his solid and active assistant, DeVoy. He registered among the early ones.

James W. Nelson, of Richard Dudgeon, put in an appearance Tuesday afternoon. Friend Nelson isn't exactly a globe trotter; but he does cover quite some ground in the course of a year in visiting railway officers throughout North America.

R. D. Smith, who some years ago turned his back upon the cornfields of Nebraska in favor of the bean fruit and codfish of Boston, greeted ye editors on Tuesday with his customary smile. The change of diet appears not to have impaired his geniality in the least.

The question has been raised whether the orange-colored blossoms that flourish on the pergola are really orange blossoms, or whether a pumpking seed has secreted itself in one of the jardinieres at the base of the column and sent its thrifty tendrils up to meet the myriad electric lights; or whether, indeed, it may not be a Burbank seedling, the result of planting squashes and watermelons in the same patch.

William O. Duntley, president of the Chicago Pneumatic Tool Company, accompanied by Mrs. Duntley, Miss Nellie Hunt and Crawford Hunt, Chicago, sailed on the steamer George Washington from New York, on June 6, for a pleasure trip in foreign lands. They will go direct to Berlin and then attend the International Railway Congress at Berne.

Reuben C. Hallett, representing the railway department of the estate of Edward R. Ladew, has brought along this year the auditor of the estate, A. R. Surpluss. Mr. Surpluss' presence is not necessarily for the purpose of seeing that Rube keeps his accounts straight, but primarily to become convinced of the importance of these conventions to all who have anything to sell to railways. As early as Wednesday morning Mr. Surpluss expressed himself as fully convinced, and he appears likely to become a "regular."

It is worth while to call attention to the comparatively large number of ladies who appeared in the march of the Master Car Builders from the Marlborough-Blenheim to the Greek Temple on Wednesday morning. Heretofore, only a comparatively small number of ladies have followed the band on such occasions; but many of them were in evidence this year and doubtless assisted otherwise than by mere numbers in making the procession a general one.

The bombardment heard on Wednesday morning was no part of the preliminary skirmishing around the "forts" which

will form the bases of operation in the military euchre struggle. It was only the flashlight photographer making the exhibits look pleasant.

One of the inconveniences of being a newspaper man is the possibility of being roped in at any time as a temporary assistant on the staff of the *Daily*. Another contingency of such assignment is, that the man who thus kindly serves as reporter runs the risk, or almost incurs the certainty, that his own name will be omitted when it should properly appear. Such a fate befell Harry D. Vought, the veteran newspaper man and multiple secretary. He very kindly assisted in furnishing the names of those who came down on the special from New York on Tuesday, but his own name was inadvertently—though it was fated to be so—omitted from the list. It is hoped this item may reach his eye before he discovers the omission. Mrs. Vought accompanies Mr. Vought.

Pop Sisson is sure it this year. He and Wampler, Pop's latest discovery, are sitting on the lid in Mr. Forsyth's absence.

W. M. Wampler, for some time in charge of the electric railway truck department of the American Locomotive Company, has just accepted a position with the sales department of Forsyth Brothers.

L. B. Sherman, formerly secretary of the Railway Supply Manufacturers' Association, has been appointed assistant night mayor of Atlantic City, to serve during the conventions.

L. F. Purtill, accompanied by Miss Purtill and Miss Margaret Sullivan, are staying at the Traymore. This is Mr. Purtill's twenty-second convention. He was initiated as a representative of the Westinghouse Air Brake Company; but for some years past he has attended in the interest of the New York Belting & Packing Company.

A long box closely resembling a coffin box arrived at Booth 509, that of the Pressed Steel Car Company. A. M. Smith, general manager of the Coal & Coke Railway, started inquiries about it. The question arose, "Who is in it? 'Jack' Turner or 'Billy' Wilkinson?" "Billy" turned up at the psychological moment and opened the box amidst exclamations of "Poor Jack!" Then lo! a beautiful model of the new general service car came to light. Therefore "Jack" and "Billy" are still with us; and may they linger long.

One of the most pleased men here is Frank R. Coates, vice-president of the Inter-Ocean Steel Company. He has received positive knowledge that the plant is really turning out tires regularly. Frank is not fond of scaring away anything that makes a noise like an order.

A few days before leaving home, W. C. Arp, superintendent of motive power, Vandalia, announced his intention of getting here a little early in order to put in a day or two at golf. It is feared that he failed to make the proper arrangements with the weather man to insure the perfect success of his scheme, since it is practically impossible for the ordinary man to handle an umbrella and a golf club successfully at the same time.

Prof. Edward C. Schmidt, of the University of Illinois, appears to have been the earliest of the professorial adjunct to the railway associations to appear upon the scene. Prof. Schmidt's chief interest this year is his individual paper on "Freight Train Resistance," before the Master Mechanics' Association. It is scheduled for next Tuesday.

O. C. Gayley, vice-president of the Pressed Steel Car Company, is on deck, as usual.

McQuiston, of Westinghouse publicity fame, might be made to smile still more broadly if he could only make a t. f. contract for a certain other exhibit booth. For once the tables are turned.

James V. Smith, formerly with the Galena-Signal Oil Company and now manager of the railway department of the Indian Refining Company, hopes to get here before the convention adjourns. He's an old timer and his friends hope he'll "make it."

They aren't exactly heavenly twins, Jack Turner and his side partner, Wilkinson; but they resemble closely a double-backed postage stamp.

Champion Rivet Dave must have survived Staff's comet dream, because he's here, as large as life.

"Le vieux garde meurt, mais il se rend jamais." The "Old Guard" of the French army under Napoleon was accustomed to say of itself that its members died but never surrendered, but Waterloo happened. The "Old Guard" of New York has never encountered a Waterloo, but it never surrenders. The fame of this military organization is not only national but international, and its officers and men are the pick of the army, the navy and the national guard. Its Napoleon is Major S. Ellis Briggs, and in the uniform of white coats and tall bearskin hats the organization on parade constitutes a command of which the great Napoleon might have been proud to be the leader. It is the band maintained by this organization that will furnish music for all the important events during the weeks of the conventions. It has toured the country from coast to coast, under the leadership of Patrick S. Gilmore, whose mantle of leadership now rests upon Henry Conrad. The band has taken part in most important national events of a military and social character, such as acting as special escort to the President of the United States, and has been engaged to appear in the reception to Colonel Roosevelt. It will lead the march on the opening day of each of the conventions and will serve at other functions at which its services may be required.

J. Alexander Brown, who is said to have been in attendance at every convention since 1888, and who has been, in more recent years, one of the best known figures at the annual meetings of these and other associations on account of his long service as an executive of the several supply associations, will not be present this year, having been named by the United States government as one of the official delegates to the International Railway Congress at Berne, Switzerland. Whether Alex will find any Alps more steep or lofty than those he encountered on the occasion of the last session of the Congress, held in Washington, D. C., in 1905, is a matter of conjecture; but he can comfort himself on this occasion, as he did before, with the thought that sunny Italy lies beyond. He sailed on Wednesday, June 8, on the Teutonic, in company with Mrs. Brown. A. Stewart, general superintendent of motive power and equipment, Southern Railway, and his wife and daughter, are of the same party. A wireless message received after they had been out about 24 hours announced that they were all well and happy and sent greetings to their friends at Atlantic City. Mr. Brown is, however, represented at the conventions by his son, Harold, a graduate of Lafayette in 1905, and by Charles L. Dinsmore, who has been the efficient representative of The Pocket List in Chicago for many years and who was Brown's right-hand man in his several emergency applications.

### THE WAIL OF THE SOUVENIR FIEND.

I miss them, I miss them; I don't care who hears;  
I say it like that:—"I want souvenirs!"  
I've examined exhibits, I have sought with much craft  
To learn the best method of working the graft;  
And now my experience has come all to naught;  
There's not a blame one, and in vain I have sought  
From the Blenheim hotel to the end of the pier,  
Without finding one measly, doggone souvenir.

In previous years 'twas as easy as pie;  
Look over exhibits as if you would buy;  
With patience and interest the whole story hear,  
Then accept, as you went, some small souvenir.  
For the costlier gifts, the best thing to do  
Was to have wife or daughter accompany you;  
And thus, in the course of a very few years,  
You'd have a collection of choice souvenirs.

Fountain pens, opera glasses, gold pencils and such,  
Interspersed with small things not worth quite so much;  
Notebooks and card-cases, pocket-books, and alas!  
Pass cases, now useless; I can't get a pass!  
Paper-weights, pocket mirrors, divers manicure tools,  
Canes, hat-pins and stick-pins, steel measuring rules,  
Cards, jack-knives, umbrellas—nothing now for two years,  
Since supply-men refuse to hand out souvenirs.

The good days are gone, and I say to myself:—  
"What good's a convention with no chance of pelf?  
What's the good of exhibits at which no one looks  
Long enough for the salesman to get in his hooks?  
What's the use of the meetings? Nothing but talk—  
Might as well take a chair and ride up the Boardwalk,  
Or go lie on the beach and get sand in my ears.  
Why not? Nothing doing. There are no souvenirs."

### MASTER CAR BUILDERS' RECEPTION.

The reception by the president and officers of the Master Car Builders' Association at the Blenheim Exchange on Wednesday evening was one of the most pleasant of the various functions of the convention period. In the receiving party were F. H. Clark and Mrs. Clark, T. H. Curtis and Mrs. Curtis, Le Grand Parish and Mrs. Parish, C. E. Fuller and Mrs. Fuller, F. W. Brazier and Mrs. Brazier, H. D. Taylor and Mrs. Taylor and C. A. Schroyer.

The Old Guard Orchestra, stationed in the balcony, rendered a few selections during the course of the reception, and later Mrs. Alice Shaw, professional vaudeville whistler, delighted the company with several of the best selections in her repertoire. Mrs. Shaw has traveled extensively, and aside from her pleasing manner is considered to be the best entertainer in her line that the public has an opportunity of hearing.

Following Mrs. Shaw's part in the evening's entertainment refreshments were served in the west colarum of the Marlborough-Blenheim, and the evening closed with informal dancing.

### CONSOLIDATION FROM THE EXHIBITOR'S STANDPOINT.

TO THE EDITOR OF THE DAILY RAILWAY AGE GAZETTE:

I have read carefully the arguments against the consolidation of the Master Car Builders' and Master Mechanics' Associations in the editorial in the *Daily Railway Age Gazette* for June 15. I believe that there is entirely too much time wasted under the present arrangement.

If we had one good week's convention the exhibitors would, in the first place, save considerable money in the cost of

the attendance of their representatives at the convention, and, in the second, with a convention in session discussing subjects in which some of the members for the moment are not interested, there would be a constant stream of men leaving the convention daily and looking over the exhibits, returning when some subjects in which they are more interested were being discussed.

The attendance of both conventions during one week would increase the average attendance at the exhibits, and they would be able to show the railway world their improved equipment just as well as they can at present, and, in fact, better. I believe that from the supply point of view one good week's convention would be far preferable to two which are strung out over the better part of two weeks.

There are times when the attendance at the exhibits at present is good; there are many other times when nobody is present. You will increase the average attendance per day at the exhibits, and consequently they could be just as efficient with a corresponding decrease in expenses.

AN EXHIBITOR.

### MILITARY EUCHRE.

The Entertainment Committee promises that the military euchre scheduled for Friday evening will be the event of the convention season and surpass, in novelty and attractiveness, any similar entertainment that has ever been arranged. The prizes to be fought for will be on exhibition in the ball room, Exhibition Hall, from Friday noon. The committee has provided 72 prizes—36 for gentlemen and 36 for ladies. Provision has been made for the accommodation of about a thousand people, if that number express a desire to join the contest, and the committee earnestly hopes that as many as that number will join in the game.

The game will take place in the ball room, there being no other suitable locality affording sufficient room for the 248 tables which the committee has provided. Each of these tables will represent a fort, and will be designated and known by the name of some prominent railway man. It will perhaps be of interest to know that gentlemen play with ladies as partners, and the same partners play together throughout the evening.

The playing is precisely the same as in any game of euchre. The rules which have been established are as follows:

#### RULES OF THE GAME.

Reveille will be sounded Friday evening, June 17, at 8:30 o'clock.

All expecting to engage in battle must be on the firing line before 9 o'clock.

Skirmishing (playing) will begin promptly at 9 p. m., and eight (8) games will be played.

Ladies and gentlemen play together.

You will play with the same partner during the entire game.

So far as the playing of cards is concerned, it is the same as in any game of euchre.

Decks of cards contain all cards down to and including the "sevens," as well as the joker.

Couples facing the ends of ball room will begin the skirmish. The remaining couple will defend the "fort" until the return of the skirmishing couple.

The skirmishing couple will progress each time, whether they win or lose.

After four games have been played, the skirmishing party will be ordered back to its home fort. Then the other couples will start on a skirmish.

No playing will begin until the bugle is sounded.

All playing must cease when the bugle is sounded—no matter how the game stands.

A card in the hand must not be played.

Where a lone hand is being played and three tricks have been taken by the party playing the hand when the bugle

sounds, only one point can be counted.

In case the lone hand is euchred by the opposing side taking three tricks when the bugle sounds, two points are allowed.

When both couples are playing and three tricks have been taken by either side, no count is allowed, and the score reverts to the previous hand.

Lone hands permitted.

An assisted hand cannot go alone.

Games, not points, will be counted.

Prizes will be awarded to both lady and gentleman.

You cannot take your partner's best.

The party revoking will lose two points.

The couple or couples winning the greatest number of games win the prizes.

*Note:* Guests of railway men or supply men may play, but will not be contestants for prizes. To be a contestant for prizes one must be: A railway man or a member of the immediate family of one; a railway supply man or a member of a supply man's family.

For the purpose of keeping these rules constantly available, the committee has provided a card bearing upon one side blank spaces for the name of the player, his business or railroad connection and his address. There is also space for keeping a record of the number of games won and the name of the partner. Each card will be examined and approved by a committee of judges. The rules are printed upon the reverse of the card.

#### MR. HOOLEY ON INTERCHANGE INSPECTION.

"What's thim intherchange things, Mister Hooley?" asked Mr. Dennissey. "I was sittin' in th' caddy at th' Marlbrew-Blennom th' last night's night that was, 'nd some Emseebees 'nd McHannixes was at th' nixt table. They was arl a-talkin' about rulers av intherchange, 'nd inshpection, 'nd intherchange points. What's intherchange points?"

"Them's th' pla-aces where ye'll crarl down off th' thrucks to shtrich ye'er legs on ye'er way home iv ye sit manny more nights in th' Marlbrew-Blennom caddy," replied Mr. Hooley significantly. "Thim's th' places where wan' road inds 'nd another begins, only ye don't see no beginnin' nor endin'. 'Twud be well f'r ye, Dinnissey, to get a map 'nd lit me marrk th' intherchange points betwixt here 'nd Tchicago, so't ye'll know where they are 'nd can crarl down at th' nixt shtop before 'nd shtrich ye'er legs be walkin' in. 'Tis a har-rd wurrk t'ride on th' thrucks over th' frogs av a big intherchange point. 'Nd th' inshpictors might pick ye off f'r wan av thim grane buds I was tillin' ye av th' other day."

"Avin so, 'tis betther, I'm thinkin', thin it will be t' have th' byes arl come round th' day afther ye're sint home, 'nd say, 'How nat'ral Hooley looks!' as they'll have th' chance iv ye don't kape away fr'm th' places off th' Boordwalk," retorted Mr. Dennissey, who had become surprisingly improved in repartee during his brief stay in Atlantic City. "What's th' intherchange points iv I ride home in th' varnished cars?"

"They don't cut much figure f'r th' varnished cars," replied Mr. Hooley, wholly subdued by his friend's retort and the thought of the probable knowledge that had prompted it. "They're th' places where wan road resaves freight cars fr'm another road, iv th' inshpictor don't shtop thim, 's he gin'rally does to get avin with th' inshpictor f'r th' other road f'r shtoppin' some av his cars. He's th' ruler av intherchange that ye'er caddy frinds mintoned. I mane he's th' boss, 'nd not th' thing that ye dhrav a sthraight line with."

"Th' inshpictor's a busy man," continued Mr. Hooley. "He's made th' boss av th' intherchange point f'r th' purpose av seein' that a car don't get on th' road he ripsints unless it's likely to howld together iv it goes slow till it gets where th' nixt road begins. Thin he has to kape avin wit' th' inshpictor av th' line that he takes th' car from 'nd that

takes th' cars fr'm his road 'nd who's shtopped some av his cars before. Ivery time he finds something wrong with a car that comes to him he has to write a shtory about it on a car-rd 'nd nail it on th' sill av th' car. Thin, iv he has time 'nd th' matayrials are handy, he minds th' car as th' car-rd says. Ye see, Dinnissey, relrod min's so honest that iv th' inshpictor putts a car-rd on th' car 'nd says he's minded it, th' comp'ny that owns th' car pays th' bill, 'nd th' more bills he can make to be paid to his comp'ny without th' waste av good matayrial, the betther man he is f'r th' comp'ny. Sometimes whin they's a rush av business, he don't have time to do annything but putt on th' car-rd, 'nd his road'll get pay f'r what th' car-rd says. 'Nd thin, iv he's time 'nd plinty av car-rds, he writes out a lot av thim 'nd tacks thim on at th' same time 'nd his comp'ny 'll get pay f'r three or four hose or cooplers putt on th' same car, whin, maybe, they wan't anny putt on. Iv th' man that passes th' bills f'r th' other comp'ny raymimbers that his own inshpictors have used up a lot av car-rds 'nd th' books show that they've not sint in rekisitions f'r much matayrial, he says to himsilf, says he, 'Tis a good inshpictor, Jawn is,' says he, 'but he's got no show where he is with only tin thrains a day to inshpict. I'll putt him where he'll have fifty,' says he, 'nd he'll make a ricord 'nd some money f'r th' comp'ny, 'nd th' manigemint 'll say I'm a good wan.' Thin he'll pass th' bills, like ye, Dinnissey, wud t'row away the six-spot whin ye'er partner's played th' quane."

"Y'undhershtand, 'tis this way, Dinnissey. Th' relrods arl use th' other road's cars like they was their own, axcept whin they haven't anny to shpake av av their own, 'nd thin they've got to use th' others annyhow. Th' road that owns th' cars has got to pay f'r th' damages to 'em. Th' cooplers gets knocked off or pulled out, 'nd th' air brake hose shplits, 'nd th' whales gets flat shpots in 'em whin th' engineer gets to dram'in' av whin he used to ccast down hill on a bar'l stave 'nd forgets to lit off th' brakes. Thin th' valves av th' air brakes gets goomy 'nd th' inshpictor clanes 'em whin they made it be markin' th' date on th' outside. 'Tis more wurrk to clane th' air brakes than to mind arl th' rist av th' car. Th' inshpictor has to mark th' date on th' thripple 'nd th' cylinder, 'nd he has to get out his stincil 'nd muss himsilf with white paint. Arl th' other repairs he makes wit' th' car-rd, 'nd 'tis a clurical job, forby th' nailin' av th' car-rd on th' car. 'Tis a fine job, barrin' th' times whin he has to go out in th' night, 'nd th' wit, 'nd th' snow, 'nd th' cowlid, with his lantern 'nd his big mittens on, 'nd putt car-rds on a long thrain. Th' thrains won't shtop long, 'nd 'tis a lively job to nail on enough car-rds to kape up his ricord f'r usin' car-rds. Th' more car-rds th' more times th' owld man writes, 'Gr-reat wurrk, Jawn!' Th' bist inshpictor I iver knew was a man who'd been printis to a carpenter 'nd spint his time nailin' lath. He always tuk a clark along with him to putt th' numbers av th' cars 'nd th' litters av th' road on th' car-rds he'd writed before th' train come in. He's a chafe gin'ral inshpictor now."

"Does th' other road iver find out that th' car-rds have been shtacked?" asked Mr. Dennissey, who had listened attentively.

"Iv th' chafe clark's on his vacation 'nd somebody else O. K.'s th' bills 'nd signs th' owld man's name 'nd takes notice av a bill f'r four hose on wan car wan day putt on at th' same place be wan man, he tills th' owld man iv he thinks av it, 'nd thin th' owld man takes it up with th' inshpictor's owld man, 'nd carls attintion to th' mishtake in th' bill, iv, as I insinooated, he don't think 'tis worth while to lose this thrick f'r th' sake av th' nixt two, afther he's jacked up his own inshpictors 'nd towld thim to get busy."

"Iv he concludes to take that thrick," queried Mr. Dennissey, "how does th' inshpictor come off?"

"Wit' harns 'nd wiskers," replied Mr. Hooley. "He's th' go-at."

## IT MIGHT HAVE BEEN.

Bathed in the sun, in the sea far out  
 Stood the pier worth a million (or thereabout).

'Twas a day in June, and "What's so rare?"  
 But rare or well-done, I don't care.

The sea was blue, and bright, and grand,  
 And the whimp'ring wavelets licked the sand.

Near the end of the pier sat the man who'd come  
 To demonstrate cleaning by vacuum.

The hour was quiet and time was cheap;  
 With a nod or two he was fast asleep.

But his demonstration was brushing clothes,  
 And, sleeping, he held in his hand the hose.

As he moved in his sleep the hose slipped through,  
 And the nozzle dipped in the wavelets blue—

Only a moment, but quick as a wink  
 The vacuum swallowed a hasty drink;

Only a moment, but one long pull  
 Filled the canvas dust-bag level full.

Came later a visitor, who wanted to know  
 If vacuum machines were good on the "blow."

"Sure thing," said the man, aroused from his slumber;  
 "I've aerated pillows and beds without number,

"And sometimes in dusting it's better to blow;  
 The action's a little more gentle, you know.

"The pump works as well to compress as exhaust,  
 In making the change not a moment is lost;

"There's only one coupling I have to adjust;  
 Then I'll blow from your shirt every atom of dust.

"You see how I do it? There's nothing to do  
 But transfer the hose to connection No. 2."

When making the change he had shut off the air,  
 While his visitor looked at the nozzle with care.

The pump being started—Well, what do you think?  
 That cleaner disgorged all its ill-gotten drink,

With the rest of its contents—a few quarts of dirt—  
 On the visitor's glist'ning, immaculate shirt!

That's all of the story. We're told in our youth  
 By those we're enjoined to believe speak the truth,

How completely a vacuum Nature abhors,  
 And that this is among her unchangeable laws;

But Nature's abhorrence is inactive and mild—  
 Her laws as uncertain as moods in a child—

Compared with the hostile, unchanging demeanor  
 Of this man who went wrong on a vacuum cleaner.

## HIGH SPOTS IN THE LIFE OF A DAILY.

BY FRANCIS W. LANE.

## II.

The next year the conventions went back to Alexandria Bay. It was the same distance from Clayton as in 1888, the St. Lawrence was there, beautiful as of old, but still unsatisfactory as a substitute for a pneumatic tube as a means of communication between editor and printing-office, the printing-office itself was the same as of old, but with seven years of venerability added, and an additional stroke of unkind fate was in store for us. The editor was sick, and his physician peremptorily refused to allow us even the light of his presence. The doctor knew his man, and that bodily presence alone would seem a mockery five minutes after the wheels started. Under these circumstances, the business manager, the sub-editor and the two representatives of the business staff—as many as could be afforded in the times of 1895—conceived a huge joke on their absent chief. They would all put on the armor of the editorial department and forget to change it for pajamas. In wedge formation they would buck the line, introduce some innovations into the off-side plays and perpetrate a paper which would at least make the spectators take notice. They did it—both the team and the spectators. The chief in his far-away home also looked, and said it was good. So good, indeed, that a few years later he felt that he could go on a vacation in the middle of the game without any intervention of the medical profession.

The copy-boy at Alexandria Bay was a steam yacht. It served the purpose excellently as to capacity, but was a little given to loitering among the Thousand Islands, and the wages were abnormally high—\$30 a day. It was surprising, too, to note the number of people who wanted to make trips with the copy-boy—to see how the paper was printed. Possibly they were curious to see a printing-office that could turn out such spotted work. But we were proud of the substance, and put up with its shadowy impression. Most of the issues were of 16 pages—all the printing plant could stand or lie down upon. An incidental attraction of this issue was a beauty-show contest in the form of a supplement containing half-tone portraits of ten well-known members badly cut up, and to be pieced together properly for prizes of certain literary lucre—"Compound Locomotives," "Biographical Directory of Railroad Officials," etc.

By 1896 the staff of the *Daily* had become so well organized and each year witnessed such improvements in printing facilities available that epoch-making events were of less frequent occurrence. It will not be profitable to follow the course of each year as an individual history. For nine years the advertisements were printed in colors and in advance. The numbers of pages of advertisements and reading matter were constantly and almost regularly increased; of the former, 28, 32, 60, 64, 76 and 88 are representative figures; of the latter, varying with different issues, 24, 32, 40, 48 and 56. When a new printing-office was opened at Saratoga with a thoroughly complete equipment, including linotype machines, and the conventions contracted the habit of going there each year for five years, many of the sources of previous trouble were removed.

The year 1897 was memorable. Mention has been made of the quality of labor and equipment available at Hampton. On the evening of June 14 of the year named, the engine began to grow cranky with the putting on of the first form and continued so nearly all night, or until it finally broke in an essential part. The paper must be run off in a medieval, not to say primeval, fashion. Sixteen husky, dusky sons of the South, in attendance at the government school, were impressed in more ways than one. They were employed to make themselves more useful than in standing around in

open-mouthed astonishment watching a group of Chicago printers sling type. A crank was attached to the cylinder of the press, and in four shifts of four men each, they operated that press by hand for the rest of the night and most of next day, until the engine could be fixed by getting a new part from Richmond to replace the one broken. A photograph of this primitive method of running off a daily paper was taken next day, and a reproduction appears in the issue of June 18. As a job of presswork, the paper\*so printed compares favorably with any previously issued.

Notwithstanding the efficiency of the Virginia negro when attached as motive power to a printing press, he was generally unsatisfactory in handling exhibits. This, the fact that a bath in the sea sometimes meant another in witch hazel, and the destruction of the Hygeia Hotel at the behest of the government, all contributed to seal the fate of Old Point as a meeting place.

But even at Saratoga engines and presses were not indestructible. In 1900 the press gave out one morning at 2 a. m. Parts for replacement were not available nearer than Albany, and no trains until morning. The foreman and some of his aides—all from Chicago—acquired a wagon from the yard of a calmly-sleeping native, hitched themselves to it, loaded in the forms and started off to complete the job elsewhere. Meanwhile others of the force had hunted up the elsewhere. They found a printing office, broke in, got up steam, and planted the forms on the press. When the proprietor came in in the morning, he found a lively gang running off the paper on his press, and a goodly pile of printed sheets to attest to their earlier activity. Then the boys called up their own manager, told him what they had done and opined that it was up to him to furnish the necessary apologies. He did. Ever since that time it is currently reported that whenever the *Daily* is in town men are covertly watching for an opportunity to throw a stick into the press of the man who happens to have the contract for the printing.

For five years, including 1904, the Saratoga existence, with the exception noted, was comparatively uneventful, though always strenuous. Following the great daily issue covering the International Railway Congress, and of which some account is given further on, only a month intervened before it was necessary to provide for the regular issue of the *Daily*. The conventions were at Manhattan Beach that year, and the printing was necessarily done in New York. This was rather long range, but was compensated by good transportation facilities and an adequate print-shop. This year witnessed the abolition of the rainbow printing and the advance printing of advertisements. Then came four years of conventions at Atlantic City—this is the fifth—during three of which the printing was done at Philadelphia. This was the longest range yet attempted, but it required only a little expedition of work to counterbalance the time consumed in transportation of copy and papers. In 1908 the name became the *Daily Railway Age Gazette*. In 1909 the experiment was tried of printing in New York, from three to four hours' distant from the place of editing. The story of that strenuous experience was told last year, and requires no repetition.

In the year when the conventions had determined to go to Mackinac, but didn't because it was found at the last minute that members would have to run their sleeping races on the relay principle, the *Daily* had made arrangements to build a shack office, equip it with the necessary presses, folders, stitchers, linotypes, etc., and give a real exhibit of itself on the ground. It may have been fortunate that these arrangements were rendered unnecessary by the change back to Saratoga.

(To be continued.)

On the Belgian state railways the operating ratio for 1908 was 69 per cent.

## IMPROVEMENT OF THE BOARDWALK.

The concrete columns sticking up in the sand between the pier and the Traymore Hotel are not, as has been supposed by some attendants at the convention, an indication that the level of the Boardwalk is to be raised to the present height of the top of the columns. These columns represent a part of the improvement which will result in increasing the width of the walk between the Traymore and the pier to the same width as beyond the Traymore, that is 60 ft. These columns will eventually be sunk in the sand by the jet process to the same level as the columns at the east end of the row; and concrete girders, for which the reinforcing rods are seen distributed upon the sand, and for which the forms are being placed, will be extended from this row of columns to a similar row underneath the Boardwalk. Three girders will support the 20-ft. extension. It is the policy of the authorities in charge of the maintenance of the Boardwalk to make all repairs and improvements in concrete, and it is probable that eventually the entire wooden structure will be replaced by one of concrete as a matter of protection from loss by fire.

## M. C. B. REGISTRATION.

Adams, T. E., G. M. M., St. Louis Southwestern Ry.  
 Ayres, A. R., M. E., L. S. & M. S. Ry.  
 Alter, Wm., G. F. C. D., Central R. R. of N. J.  
 Anthony, F. S., S. M., International & Gt. Nor. Ry.  
 Appler, A. B., M. E., Delaware & Hudson Co.  
 Barnum, Ward, Elec. Engineer, Louisville & Nashville R. R.  
 Baron, Jacob, Ky. & Ind. Bridge & R. R. Co.  
 Beaumont, H. A., G. F. Car Shops, B. & O. R. R.  
 Benson, E. A., M. S., Pullman Co.  
 Bentley, W. F., M. C. B., B. & O. R. R.  
 Bishop, G. C., S. M. P., Long Island R. R.  
 Bloxham, C. M., M. C. B., Union Tank Line Co.  
 Bossinger, H. C., G. F., Ches. & Ohio Ry.  
 Bottomly, Edw. S., Chief Jnt. Car Insp.  
 Boughton, Wm., G. M. M., Pere Marquette R. R.  
 Boutet, H., Chief Joint Inspector.  
 Braden, J. O., D. S. M. P., N. Y. C. & H. R. R. R.  
 Brandt, C. A., Asst. Engr. Mech. Const., L. S. & M. S. R. R.  
 Brown, M. G., M. M., Gulf & Ship Island R. R.  
 Bruck, Henry T., M. of M., Cumberland & Penn. R. R.  
 Bryan, H. S., S. M. P., Duluth & Iron Range R. R.  
 Burns, Robt. C., Genl. Air Bk. Inspector, P. R. R.  
 Carmer, J. R., G. F. C. S., P. B. & W. R. R.  
 Carr, W. K., N. & W. Ry.  
 Chaffee, F. W., G. Car Insp., N. Y. C. & H. R. R. R.  
 Chambers, C. E., S. M. P., C. R. R. of N. J.  
 Chambers, J. S., S. M. P., Atlantic Coast Line.  
 Christopher, Jacob, M. M., Toronto, Hamilton & Buffalo Ry.  
 Clark, J. H., M. M., Staten Island Rapid Transit Ry. Co.  
 Cook, J. S., M. M., Ga. R. R. & G. J. & S. R. R.  
 Correll, W. T., M. C. B., Phila. & Reading Ry.  
 Cory, C. H.  
 Coulter, H., G. C. I., Balt. & Wash. R. R.  
 Courson, J. F., G. F., Penna. R. R.  
 Coutant, M. R., M. M., Ulster & Delaware.  
 Craig, James, Chf. Drftsman, B. & M. R. R.  
 Cromwell, O. C., M. E., B. & O. R. R.  
 Cromwell, S. A., G. C. F., B. & O. R. R.  
 Cullinan, Jno., M. M., Central Indiana Ry.  
 Davis, Geo. G., C. F. C. D., C. C. C. & St. L. Ry.  
 Demarest, H. N., G. C. I., Penna. R. R.  
 Dickinson, F. W., M. C. B., Bessemer & Lake Erie R. R.  
 Dunlap, W. H., M. M., L. & N. Ry.  
 Dunn, J. F., S. M. P., Oregon Short Line R. R.  
 Eckhart, Jno., Jr., Erie R. R.  
 Eddy, F. H., G. F. C. D., B. & M. R. R.  
 Elmer, Wm., M. M., P. R. R.  
 Fitzmorris, James, M. M., Chgo. Trac. Ry.  
 Flory, B. P., S. M. P., N. Y. Ont. & Western Ry.  
 Fogg, J. W., M. M., B. & O., Chicago Term. Transfer Co.  
 Fowler, Geo. L.  
 Fox, Frank L., P. M. R. R.  
 Friese, N. L., G. F., Norfolk & Western Ry.  
 Grieves, E. W., Galena Signal Oil Co.  
 Gage, C. M., G. M., Huntington & Broad Top Mtn. R. R.  
 Gaines, F. F., S. M. P., Cent. of Ga. Ry.  
 Gaskill, C. S., Asst. Eng. M. P., P. B. & W. R. R.

Gill, Jno., S. M. P., Chgo Ind. & Lville. Ry.  
 Goodnow, T. H., M. C. B., L. S. & M. S. R. R.  
 Goodrich, Max, G. F., New York & Ottawa R. R.  
 Gorey, E. H., G. F., Louisville & Nashville R. R.  
 Hackett, George, Ex. M. C. B., N. Y. Central Ry.  
 Hacking, Edw., G. C. F., C. G. & W. Ry.  
 Hamett, Phillip M., S. M. P., Maine Cent. R. R.  
 Hamilton, T., M. M., Cumberland Valley.  
 Harris, Wells, G. F. C. R., N. Y. N. H. & H. R. R.  
 Hendry, Jno., M. C. B., Grand Trunk System.  
 Henry, W. C. A., S. M. P., Penn. Lines West.  
 Hitt, Rodney, Asst. Edtr., Elec. Ry. Journal.  
 Hindman, S. M., Gen. Car Insp., Penn R. R. East Div.  
 Hogsett, J. W., Chief Jnt. Car Insp.  
 Kapp, W. F., Supt. Shops & Machy., R. F. & P. Ry.  
 Kelly, J. W., Div. Car Foreman, Can. Pac. Ry.  
 Kendig, R. B., M. E., L. S. & M. S. Ry.  
 Kent, F. S., Penna. R. R.  
 Kiesel, W. F., Asst. Engr., P. R. R.  
 Kimmet, M. A., Gen. For. Car Dept., C. R. R. of N. J.  
 Kleine, R. L., Gen. Car Insp., P. R. R.  
 Krause, Julius, Gen. Car Insp., Penn. R. R.  
 Lewis, Harvey L., Foreman Car Shops, D. & H. Co.  
 Leyonmark, J. H., M. E., C. & A. Ry.  
 Lungren, W. H., Phil. Balt. & Wash. Ry.  
 Lynn, Samuel, M. C. B., P. & L. E. R. R.  
 McCuen, J. P., S. M. P., Cin. New Or. & Tex. Pac.  
 McCuen, R. E., Lexington & Eastern Ry.  
 McCully, B. N., For. C. D., N. Y. P. & N.  
 McFarland, W. W., G. M., Del. Riv. & Union R. R.  
 McGregor, A. A., M. M., L. & N. Ry.  
 McIntosh, Wm., Ex. Supt., Cent. R. R. of N. J.  
 McKinsey, C. R., G. C. I., Phila. Balt. & Wash. Ry.  
 McNulty, F. M., S. M. P. & R. S., Monongahela Connecting R. R.  
 Mandeville, H., Gen. Foreman, P. R. R.  
 Martin, J. H., Supt. Car Serv., Berwind-White Coal M. Co.  
 Mercur, R. E., T. M., Westmoreland Coal Co.  
 Middagh, D. B., N. & W. Ry.  
 Miller, E. A., S. M. P., N. Y. C. & St. L. R. R.  
 Miller, R. S., G. F. C. D. P., N. Y. C. & St. L. R. R.  
 Milliken, Jas., Supt. M. P., Balt. & Wash. R. R.  
 Millar, E. T., Gen. For. B. & M. R. R.  
 Miller, E. B., Car Insp., B. & O. R. R.  
 Miller, Geo. A., S. M. P., Fla. E. Coast Rwy.  
 Miller, Wm., M. C. B., Erie Ry.  
 Minick, Eli, G. F. C. R., Lehigh Valley R. R.  
 Moore, B. R., M. M., Miss. Cent. R. R.  
 Nicholson, Jno., S. M. P. & M., St. L. Brownsville & Mex. Ry.  
 Newton, Chas. H., Georgia R. R.  
 Orchard, Jno. H., F. C. D., D. & H. Co.  
 Osman, H. L., S. C. D., Morris & Co. Refr. Lines.  
 Ott, Wm. B., Asst. Eng. M. P., P. R. R.  
 Park, S. T., S. M. P., C. & E. I. R. R.  
 Paxton, Thos., S. M. P., El Paso & S. W. R. R.  
 Payne, H. R., V. P., Union Tank Line Company.  
 Pearson, W. H., Gen. Car Foreman, Can. Pac. Ry.  
 Peiffer, Charles E., Buf. Roch. & Pitts.  
 Perine, D. M., S. M. P., P. R. R.  
 Poole, A. J., G. M., Seaboard Air Line Ry.  
 Pratt, E. W., A. S. M. P., C. & N. W. Ry.  
 Putnam, C. H., F. C. D., Atlanta, Bir. & Atlantic Ry.  
 Robider, W. J., Cent. of Ga. R. R.  
 Robins, S. P., Chief Draughtsman, Can. Pac. Ry.  
 Rink, Geo. W., M. E., Cent. R. R. of N. J.  
 Ridgway, H. W., M. M., Colo. & So. Ry.  
 Rollings, E. O., M. & M., L. & N. Ry.  
 Rumney, T., Gen'l Mech. Supt., Erie.  
 Schmoll, G. A., S. M. P., B. & O. R. R.  
 Schnepel, J. H., Chf. Draughtsman, N. Y. C. & H. R. R.  
 Schroeder, J. H., Frt. Car Fore., D. L. & W. R. R.  
 Schroyer, C. A., S. C. D., C. & N. W. Ry.  
 Shackford, J. M., Chf. Draughtsman, D. L. & W. R. R.  
 Sharp, Wm. E., Supt., Armour Car Lines.  
 Sitterly, W. H., Gen. Car Insp., Penna. R. R. Company.  
 Smith, L. K., Asst. M. M., Wabash R. R.  
 Stark, F. H., Supt., Pittsburgh Coal Co.  
 Stearns, W. A., M. E., Louisville & Nashville R. R.  
 Sternberg, Adam S., G. I. Car Dept., Wabash R. R.  
 Stillwagon, George W., M. C. B., Pittsburgh, Shawmut & Nor. Ry.  
 Stubbs, G. W., M. M., Gulf Line Ry.  
 Sumner, Eliot, A. E. M. P., Pennsylvania R. R.  
 Sweeley, G. P., M. M., Pennsylvania Lines.  
 Tatum, John J., S. F. C. D., Baltimore & Ohio R. R.  
 Taylor, George W., S. M. P., San Antonio & Aransas Pass. Ry.  
 Tewkesbury, E. M., G. S., South Buffalo Ry.  
 Thiele, Chas. F., Genl. Car Inspector, P. C. C. & St. L. Ry.  
 Thomas, I. B., Master Mech., Pennsylvania R. R. Company.

Thomas, W. H.  
 Thomson, Samuel G., Asst. Eng. Motive Power, Phila. & Read.  
 Tonge, John, M. M., Minneapolis & St. Louis R. R.  
 Treleven, Thos. A., M. C. B., Grand Trunk Ry.  
 VanBuren, C. W., M. C. B., Can. Pac. Ry.  
 Vittum, J. E., Chief Joint Inspector.  
 Walsh, F. O., M. M., Atlanta & West Point & West Ry.  
 Waughop, Chas., Chief Joint Car Insp.  
 Wilson, R. D., Asst. Chief Car Insp., P. & R. R. R.  
 Wyman, R. L., M. M., Lehigh & New England R. R.  
 Young, Charles D., A. E. M. P., Penna. Lines West.

## M. C. B. GUESTS.

Adam, J. W., Piece Work Inspector, B. & O.  
 Adams, C. S., Jnt. For., N. Y. O. & W.—N. Y. C.  
 Adams, T. S., M. M., Atlantic City & Shore R. R.  
 Alter, Fred.  
 Altwater, Chas. P., Gen. Foreman, C. Dept., Penna. R. R.  
 Anderson, H. A., Foreman, Penna. R. R.  
 Atkinson, C. R., Secy. G. S. M. P., P. R. R.  
 Austin, J. B., Jr., Eng. M. W., Long Island R. R.  
 Ballweg, F., Asst. Supt., Bayonne, Union Tank Line.  
 Balsley, John, Freight Train Master, P. R. R.  
 Baltz, Valentine, Ch. Joint Car Insp., B. & O. and Penna.  
 Barwis, J. McC., For. Car Insp., P. R. R.  
 Baugh, R. T., Pur. Agt., Cent. Ry. of Georgia.  
 Beaghem, Thomas, Jr., Insp., Union Tank Line.  
 Beamer, J. A., M. M., P. R. R.  
 Beck, Henry J., Genl. Loco. Insp., P. & R.  
 Bennett, F. G., Supt. of Agencies, Atlanta & West Point.  
 Berg, L. J., Mech. Insp., Pullman Company.  
 Bernheisel, L. W., Berwind-White Car Company.  
 Bevan, P. A., Draftsman, P. R. R.  
 Bill, G. W., M. M., Union Tank Line.  
 Blair, H. A., Gen. Foreman, B. & O.  
 Bloxham, C. T.  
 Bonhoff, H. J., Union Tank Line Insp.  
 Bradley, E. J., Foreman, P. B. & W.  
 Bradshaw, J. H.  
 Brewer, J. W., Asst. M. M., B. & O.  
 Brubaker, H. H., M. P. Clerk, P. R. R.  
 Burgoyne, C. J., Asst. Gen. For., P. R. R.  
 Burke, H. C., Gang Foreman, Shop, B. & O.  
 Butts, H. M., M. C. & L. Ptr., N. Y. C.  
 Calder, W. W., Gen. Car Foreman, B. & O.  
 Cameron, G. M., Berwind-White Car Company.  
 Cameron, W. R., Supt. Berwind-White Car Company.  
 Campbell, Chas. S., Gen'l Supt., U. S. Express.  
 Campbell, H. F., M. E., Q. & C. R. R.  
 Carsell, H., Asst. Station Master, West Jersey & Seashore.  
 Carter, B. D., Car For., Virginia Ry.  
 Chamberlain, J. A., Asst., Union Tank Line.  
 Chapin, E. S., Ins. M. P. Dept., P. R. R.  
 Clapp, D. A., Asst. Train Master P. R. R.  
 Coates, H. T., Jr., Gen'l Foreman Gen'l Mgr. Office, P. R. R.  
 Cochran, C. C., Sec. to J. F. Walsh, C. & O.  
 Cook, E. F., Union Tank Line.  
 Couch, Frederick F., Engineer, P. R. R.  
 Coulter, A. F., Gen. Car Foreman, Union Ry.  
 Connor, J., For. Inspectors, Washington Ter.  
 Connor, Wilver.  
 Covert, M. F., Asst. M. C. B., Swift Car Lines.  
 Crone, A. E., Div. S. K., N. Y. C.  
 Cummin, Robt., Car Insp., L. V.  
 Daughenbaugh, L. W., Engineer, P. R. R.  
 Davis, Geo. L.  
 Davis, Harry E., P. R. R.  
 Davis, Joseph, Master Mech., P. R. R.  
 Denchey, Wm., Ch. Clk. to Supt., P. R. R.  
 Dette, R. E., Shop For., P. R. R.  
 Dildine, J. A., Chief Clerk, M. P. Dept., Penna. Lines, West Southwest System.  
 Dillon, Howard W., Draftsman, P. R. R.  
 Donovan, A. G., Armour Car Line.  
 Dow, T. W., Gen. Air Br. Insp., Erie.  
 Downs, M. D., Foreman, P. R. R.  
 Dressman, J. L., Shop Inspector, B. & O. R. R.  
 Dryden, C. P., Union Tank Line.  
 Durham, George, M. M., L. & N.  
 Dunlap, W. H., M. M., L. & N.  
 Eames, J. P., Car Foreman Pgh. Syst., B. & O.  
 Effinger, Wm. P., Insp. of Bills, Erie Ry.  
 Ellsworth, G. M., Chief Motive Power Clerk, P. R. R.  
 Eugard, A. C., Ch. Eng., U. S. Navy.  
 Ewan, H. F., Agt., U. S. Exp. Co., Atl. City.  
 Eyerly, W. S., Air Brake Inspector, B. & O.  
 Ferguson, O. G., Supt. Transp., Monongahela Conn. Ry.  
 Fielding, H., Union Tank Line.

Files, F. S.  
 Finnerty, H. A., Pur. Agt., Union R. R.  
 Foyle, C. E.  
 Frost, F. R., El. Eng., Atchison, Topeka & Santa Fe.  
 Fulmor, J. H., M. M., P. R. R.  
 Gamey, J. J., For. Car Dept., C. & N. O. & T. P.  
 Garber, Samuel.  
 Gardner, G. C., Gen. For., P. R. R.  
 Geisking, Charles, Gen'l. Foreman, P. R. R.  
 Gernert, Henry, Foreman, Cent. R. R. of N. J.  
 Graburn, A. L., Mech., Asst. to 3d V. P., Can. Northern.  
 Graft, F. M., Ch. Cl., Supt. Car Dept., Erie R. R.  
 Gray, C. B., Asst. Gen. For., P. R. R.  
 Griffith, Jno. W., Pur. Agt., Union Pacific.  
 Grove, P. L., Asst. M. M., P. R. R.  
 Hackett, Geo.  
 Hagen, Chas., Gen'l. Foreman Car Shops, W. & L. E.  
 Hammond, G. O., M. E., New York Air Brake Co.  
 Hampton, K., Ch. Fr. Inspector, B. & O. and P. & R.  
 Harris, C. M., M. M., Washington Term. Co.  
 Harris, T., Div. Car For., Can. Pac. Ry.  
 Hastings, Frank, Penna. R. R.  
 Hawthorne, John W., Gen'l. Foreman, P. R. R.  
 Hayward, J. R., Div. Car Insp., M. & W.  
 Heim, Geo., Supt. Car Shops, Union Tank Line.  
 Henderson, J. P., Pur. Agt., Armour Car Line.  
 Hepburn, M. J., M. P. Clerk, P. R. R.  
 Hess, Geo. F., M. M., B. & O.  
 Hess, R. A., Foreman Car Dept., C. R. R. of N. J.  
 Hill, J. P., S. K., P. R. R.  
 Hill, W. D., G. F. A., P. C. & Y.  
 Hogan, C. C., Union Tank Line.  
 Holmes, H. H., Gen'l. Agt., P. & R.  
 Holst, W. A., Ch. Cl. Mch. Dept., Union Tank Line.  
 Holtz, David, Master of Machinery, Western Md. R. R.  
 Hudson, B. F., Air Brake Insp., B. & M.  
 Ingersoll, G. R., P. A., T. I. & M. S.  
 Ishida, Taro, S. M. P., Western Div. Imperial Gov. Rys. of Japan.  
 James, C. H., Supt. St. Oil Car Shops, Union Tank Line.  
 Jansen, E. W., Electrical Engr., Illinois Cent. at Chicago.  
 Jellison, B. T., Pur. Agt., C. & O.  
 Jenny, Jacob, Foreman Car Rep., Monon Div., P. R. R.  
 Johnson, J. O., For. Car Rep., Southern R. R.  
 Johnston, B., Mech. Engineer, M. & O. R. R.  
 Jones, W. F., Gen. Store Keeper, N. Y. Cen.  
 Jordon, L. F., Pur. Agt., Kansas City Southern.  
 Justus, I. J., Spec. Insp., N. Y. C. & H. R.  
 Kapp, H. W., Ret. Sp. Agt., P. R. R.  
 Kauffman, G. B., Pass. Agt., Atlantic City R. R.  
 Keim, A. W., Union Tank Line.  
 Kilpatrick, J. B., S. M. P., Chi. Rock Isl. & P.  
 Kilpatrick, R. F.  
 Klein, R. A., Supervisor, P. R. R., W. J. & S. S.  
 Kleine, R. L., C. C. Insp., Penna. R. R.  
 Klingensmith, W. H., Shop Foreman, Monon Div., P. R. R.  
 Kyle, Thos., Gen'l. Foreman N. Y. P. Div., N. Y. Central.  
 Lambert, W. H., Union Tank Line.  
 Lenhart, C. W., Gen. Car For., B. & O.  
 Lewis, A. E.  
 Lewis, C. E., Gen. For., Penna. R. R.  
 Lewis, C. W., M. M., Union Tank Line.  
 Lipp, Chas., Asst. Foreman Car Shops, P. R. R.  
 Lynch, Geo., Joint Inspector, Penna. Lake Shore.  
 McBain, D. R., S. M. P., L. S. & M. S.  
 McCarthy, J. M., Pur. Agt., Chi. Rock Island & Pac.  
 McCausland, A. G., Supt., P. & R.  
 McCormick, C. A., Chief Clerk, Q. & C.  
 McCrea, J. A., Gen. Sup., Long Island.  
 McElroy, F., Secy. M. C. B., Union Tank Line.  
 McGregor, A. A., M. M., Etowah.  
 McKenzie, R., Div. Car Foreman, Can. Pacific.  
 McMillan, Jno., Gen'l. Car Foreman, Erie R. R.  
 Mahr, Frank, Clerk, Penna. R. R.  
 Mann, J. F., Gen. Car For., P. M.  
 Marsh, H. B., Clerk, P. R. R.  
 Marshall, Geo., Foreman Car Shops, P. R. R.  
 Mason, E. F., M. P. Ins., P. R. R.  
 May, Walter, M. M., C. C. C. & St. L.  
 Mendenhall, D. H., Gen'l. Foreman, W. T. Ry. Co.  
 Miller, F. P.  
 Morris, W. S., Foreman, P. B. & W.  
 Morrow, C., Union Tank Line.  
 Milroy, J. R., G. S. K., Frisco R. R.  
 Neville, Fred. M., Mast. Car Repairs, Union Tank Line.  
 Nichols, J. S., For., Union Tank Line.  
 Nunn, W. C.  
 O'Day, B. J., Gen'l. Car Insp., Erie R. R.

Osman, H. C.  
 Park, Orlando, C. & E. I. R. R.  
 Peterson, W. E., Shop For., Un. Tank Line.  
 Peyton, O., Union Tank Line.  
 Plow, A., Mech. Insp. Car Dept., Can. Pac. Ry.  
 Porter, W. M., Gen. For., Penna. R. R.  
 Prentice, W. H., Clerk, P. R. R.  
 Price, J. H., Mot. Power Clerk, P. R. R., P. B. & W.  
 Redmond, D. H., Union Tank Line.  
 Reilly, Thos. E., Clk. Off. of Supt. of Transp., P. R. R.  
 Renner, C. W., Asst. G. F. C. Shop, P. R. R.  
 Rhine, Geo. B., Engine House Foreman, P. R. R.  
 Rollings, E. O., M. M., L. & N. R. R.  
 Ross, Walter, chief Clerk, Gen. Str. Keeper, N. Y. C. & H. R.  
 Roth, H. L., Gen. For. Car Dept., C. N. O. & T. P.  
 Rusling, W. J., Gen. Foreman, Penna. R. R.  
 Sashby, J. M., Ch. Car Ins., N. Y. P. & N.  
 Schanze, H. C., Foreman Laborers, P. R. R.  
 Schenck, Edwin, Jr., Asst. M. M., P. R. R.  
 Schrader, J. R., Gen'l. Foreman Hud. Div., New York Central.  
 Shupert, F. W., Gen. Boiler Maker Foreman, A. T. & Santa Fe.  
 Sindall, G. E. M., M. C. B. Clerk, P. R. R.  
 Singleton, A., Ch. Clk. S. M. P., H. V.  
 Singleton, C. W., Foreman Car Shops, P. B. & W. R. R.  
 Smart, Geo. E., Div. Car Foreman, Can. Pac.  
 Smith, A. E., Union Tank Line.  
 Smith, A. M., Gen. Mgr., Coal & Coke Ry.  
 Smith, W. D., Union Tank Line.  
 Smith, W. T., S. M., P. C. & O.  
 Stanton, E., Ch. Joint Car Insp., Norfolk & Portsmouth Belt Line.  
 Stevens, F. J., M. M., Lackawanna & Wyoming Valley.  
 Stoll, W. J., Chief Interchange Insp.  
 Stone, H. F., Asst. Supt., Union Tank Line.  
 Straub, C. F., Bill Clerk, M. C. B., P. & R.  
 Sullivan, J. C., Insp., Union Tank Line.  
 Tatum, Chauncey R., B. & O.  
 Taylor, F. C., M. P. Insp., P. R. R.  
 Taylor, J. J.  
 Telford, A., Purchasing Agt., C. N. O. & T. P.  
 Terrell, C. H., S. M. P., C. & O.  
 Thomas, W. C., Lumber Agent, P. R. R.  
 Thorp, Clark N., Union Tank Line.  
 Trace, A. A., Ch. Bill Clerk, Erie.  
 Tracey, Thos., Asst. Supt., Car Dept., Erie R. R.  
 Van Valine, H. D., M. M., B. & O.  
 Vought, H. D., Secy. N. Y. R. R. Club.  
 Waterman, J. H., Storekeeper, C. B. & Q. R. R.  
 Watson, R. B., Engr. of Tests, Erie.  
 Wiedner, A. B., Asst. Supt., P. & R.  
 Wilt, W. L., Ch. Clerk, P. R. R.  
 Wilson, J. W., Ch. Joint Inspector, P. & R. and N. Y. C.  
 Walker, J. W., Air Brake Insp., P. R. R.  
 Wescott, E. A., Supt. Car Dept., Erie R. R.  
 Wheaton, Wm. H., M. M., Wilkes-Barre & Wyoming Valley Tract Co.  
 Yaiser, H., Asst. Foreman Car Shops, P. R. R.  
 Yates, L. L., Supt. Car Shops, Pac. Fruit Express Co.

#### LIST OF EXHIBITORS.

The following represent the additions and corrections to the list as printed in yesterday's *Daily*:  
 American Mason Safety Tread Company, Boston, Mass.—Mason safety treads; Empire carborundum treads; Karbolith composition floors for coaches and buildings. Represented by Henry C. King and L. H. Myrick. Space 438.  
 Anchor Packing Company, Philadelphia, Pa.—Metal and fibrous packings and mechanical rubber goods, Tanril sheet packing. Represented by L. E. Adams, W. R. Haggart, E. C. Adams, Geo. L. MacCabe, Chas. M. Barnes, John F. Edmonds and B. J. Miller. Space 319.  
 Ashton Valve Company, Boston, Mass.—Valves and gages. Represented by Fred. A. Casey, Albert C. Ashton and J. W. Motherwell.  
 Bird & Company, J. A. & W., Boston, Mass.—Ripolin enamel; signal joint packing; Rex refrigerator felt; red and black rope car insulating paper; car roofing. Represented by C. E. Rahr, F. E. Cooper, C. F. Abbott and P. L. Griffiths. Space 425.  
 Brown Automatic Coupling Company, Cleveland, Ohio.—Hose coupling. Represented by W. J. Kirkpatrick. Space 316.  
 Buck Boring Bar Company, Huntington, W. Va.—Boring bar for boring steel car wheels. Represented by C. M. Buck. Space 155.  
 Carbolineum Wood Preserving Company, New York, N. Y.—Avenarius carbolineum. Represented by E. F. Hartman and Ralph M. Eisenberg. Space 308.

Coale Muffler & Safety Valve Company, Baltimore, Md.—In booth of the Nathan Manufacturing Company. Locomotive safety valves. Represented by H. C. McCarty.

Coe Manufacturing Company, W. H., Providence, R. I.—Coe's ribbon gold leaf and Coe's gilding wheels; Coe's high burnish bronze. Represented by B. A. Smith and Mr. Arlein. Space D. 2.

Davis-Bournonville Company, New York, N. Y.—Reclaimed locomotive crossheads; driving rod strap; coach bumper reclaimed by welding in the middle; grate bar; truck frame; steam boiler with patches welded in; aluminum coffee pot with spout welded on; 4-inch steel bars to be cut; boiler tubing welded into a plate. Represented by W. R. Noxon, William Joyce, John M. Grosart, C. E. Lister and C. F. Gessert. Space beyond the Greek Temple.

Fairbanks, Morse & Company, Chicago, Ill.—Gasoline section and inspection motor cars; telescopic standpipe and sectionalized valve; chain hoists; tools; rail drills; power pump and motor; line of Geared Ratchet; Ratchet; ball and cone bearing screw jacks and hydraulic jacks. Represented by A. A. Taylor, Geo. J. Akers, E. M. Fisher, F. M. Condit, F. H. Douglas and A. C. Dodge. Space 510.

Forsyth Brothers Company, Chicago.—Forsyth centering device; friction draft gear; cast steel yoke for freight cars; pressed steel doors; Brinkerhoff side construction for passenger cars; pressed steel mouldings and sash. Represented by A. H. Sisson and W. M. Wampler. Space 472.

Franklin Railway Supply Company, New York, N. Y.—Booth containing files of daily papers from different parts of the United States. Represented by J. S. Coffin, Samuel G. Allen, A. G. Elvin, C. L. Winey, R. G. Coburn, W. L. Allison and H. S. Hayward. Space 410.

Keystone Lantern Company, Philadelphia, Pa.—The Casey standard railway hand-lantern. Represented by Jno. T. Casey, A. H. McOwen, Percy Jones and B. W. Mudge. Space 428.

Lehon Company, The, Chicago, Ill.—Roofrite roofing for coaches, refrigerator cars, locomotives and railroad shops; also dry-art insulating paper. Represented by Tom Lehon. Space 212.

Locomotive Improvement Company, Clinton, Iowa.—Markel's removable driving box brass; removable side plate (for lateral motion) and flangeless shoes and wedges. Represented by L. W. Barker. Space 13.

McGraw Publishing Company, New York, N. Y.—Electric Railway Journal and Engineering books; Electrical World; Engineering Record; electric railway directories. Represented by H. M. Wilson, Rodney Hitt, H. W. Blake and Walter Boedecker. Space 7.

Modoc Soap Company, Philadelphia, Pa.—Perfectol car and locomotive cleaner. Represented by Henry Roever and J. McD. Holtzinger. Space 434.

Nachod Signal Company, Philadelphia, Pa.—Nachod automatic block signal, type C. Connected up with miniature track to show operation. High speed trolley contact switch. Represented by C. P. Nachod. Space 234.

Newcomb Patents Development Company, Sandpoint, Idaho.—Journal box. Represented by M. P. Newcomb. Space 319.

Osbun Company, B. M., Chicago, Ill.—Samples of the new "Boss" nut lock and literature. Represented by D. O. Ward.

Pennsylvania Steel Company, The, Steelton, Pa.—Switch stands; models of frogs and switches; pictures of material made by the frog and switch and bridge and construction departments; samples of rivet steel; samples of "never slip" switch plate. Represented by Chas. W. Reinohl and W. M. Henderson. Space beyond the Greek Temple.

Rockwell Furnace Company, New York, N. Y.—Furnaces for railroad shops. Represented by W. S. Quigley, F. S. Bostwick and F. S. Garrett. Space 4.

Scully Steel & Iron Company, Chicago, Ill.—Everlasting blow-off valves; journal box jacks; boiler tools; expanders, etc. Represented by Huntly H. Gilbert. Space 437.

Standard Car Truck Company, Chicago, Ill.—Barber standard lateral motion truck; Barber double action truck and Barber roller bearing center plates. Represented by J. C. Barber, J. T. Milner, L. W. Barber, F. L. Barber and E. W. Webb. Space 123.

Standard Coupler Company, New York, N. Y.—Standard steel platforms; Sessions-Standard friction draft gears; Standard slack adjusters. Represented by George A. Post, E. H. Walker, A. P. Dennis, R. D. Gallagher, Jr., W. H. Sauvage and C. D. Jenks. Space 339.

Standard Steel Car Company, Pittsburgh, Pa.—Reception booth. Represented by John M. Hansen, Jas. B. Brady, R. L. Gordon, H. G. Macdonald and Wm. Libkeman. Space 466.

Walworth Manufacturing Company, Boston, Mass.—Genuine Stillson wrenches; Miller ratchet stocks and dies; Smith friction track drill. Represented by G. F. Elliott. Space 232.

## The Exhibit.

The Buffalo Brake Beam Company, New York, has an attractive exhibit, showing its new types of truss brake beams, as well as a full line of its solid and special section beams.

The interesting features of the exhibit of the Gold Car Heating & Lighting Company, New York, are Gold's excelsior vapor system, combination pressure and vapor system with excelsior vapor valve, Gold's cyclone ventilators for passenger and refrigerator cars and Gold's acetylene system of car lighting.

During the business depression of 1908 and a part of 1909 active operations were carried on in the plant of the Crawford Locomotive & Car Company, at Streator, Ill. During a good part of this period as many as 900 employees were on the company's pay roll. Heavy repairs to a large number of cars were the cause of the activity.

This year the Landis Tool Company, Waynesboro, Pa., has instituted a new scheme to distribute its literature. Rather than require those interested to take it away themselves, the company has that literature which covers the railway field enclosed in stamped envelopes; and by leaving a card at the booth, the literature will be mailed to one's office.

Among other exhibits of the Farlow draft gear, The T. H. Symington Company, Baltimore, Md., is giving a very interesting demonstration of the rapidity with which a coupler can be removed and applied with the Farlow link and key attachment; also with what rapidity the entire Farlow draft gear can be taken down and put up. The coupler is removed and applied by one man in less than fifteen minutes. It is well worth the short time necessary to witness a demonstration. A Flory carry iron assists the rapidity of the operation.

In the past 10 years the use of headlight chimneys made of mica has been taken up by a large number of the railways. The use of mica has recently been extended to the lamp chimneys necessary on other styles of oil lamps used in railway service, such as caboose lamps, station lamps and also on long-time burning switch lamps. The Storrs Mica Company, Owego, N. Y., carries in stock a variety of types of mica chimneys for railway use, and is from time to time getting up new forms of chimneys for special purposes in railway use.

The McConway & Torley Company, Pittsburgh, Pa., has an exhibit in space 527 consisting of the Pitt freight coupler, Janney X freight coupler, Pitt passenger coupler, a new swivel head coupler with McConway centering device as applied to new steel passenger coaches of the Pennsylvania Railroad, Pitt tender coupler, Pitt pilot coupler, Janney passenger coupler, Buhoup 3-stem coupler, Buhoup steel truck side frame and the McConway steel wheel. The company is represented by Stephen C. Mason, secretary; E. M. Grove, treasurer; H. C. Buhoup; and I. H. Milliken.

The Independent Pneumatic Tool Company, Chicago, has on exhibition a set of Thor staybolt drivers which have brought forth a great deal of comment from those interested in locomotive and boiler work. This machine consists of two separate tools, each of which has a driving cylinder and holder-on. The driving cylinder is 9 in. stroke and the holder-on is 6½ in. stroke, each having a piston diameter of 1 1-16 in. One man can operate each tool driving both ends of a staybolt at one time, and the machine has ample capacity for driving 100 ends or 50 staybolts per hour.

The seamless steel tube is a modern invention and the use of Shelby seamless steel tubing for bushings of all types and sizes may not be known to all the mechanical men here to-day in whose shop bushings are still bored or forged from solid stock. And yet, the bushing is only one of several hundreds of purposes for which Shelby seamless steel tubing has been found adaptable. The National Tube Company, Pittsburgh, Pa., is always pleased to hear from Mechanical men on the subject of Shelby seamless steel tubing, and to send to such men the literature on the subject which the company has for this purpose.

#### NATIONAL CURTAIN FIXTURES.

The National (non-creeping) curtain fixture, made by the National Lock Washer Company, Newark, N. J., is of heavy steel tubing with bronze heads and finger pieces. It cannot easily be drawn out of groove by rough handling, is easily adjusted and is composed of few parts. It can have strong tension on rollers so as to make the curtain set smooth. This strong tension on roller also insures quick action when the curtain is raised and holds it firmly when wind is blowing.

This fixture has been specified on 600 new passenger coaches ordered in the last few months.

#### THEY SHOW THEIR HOSE.

A strong feature of the exhibit of hose for air brake and signal line service at booth 322 is the Sprague flexible steel armored hose, made by the Sprague Electric Company, New York.

This rubber hose, with an interlocking steel armor, which is said to prevent a rupture that will set the brakes seems from the demonstrations, to be all that the Sprague Company claims.

Anything that offers a reduction in maintenance cost and saves delays is worthy of a railway man's consideration. See the exhibit. It will interest you.

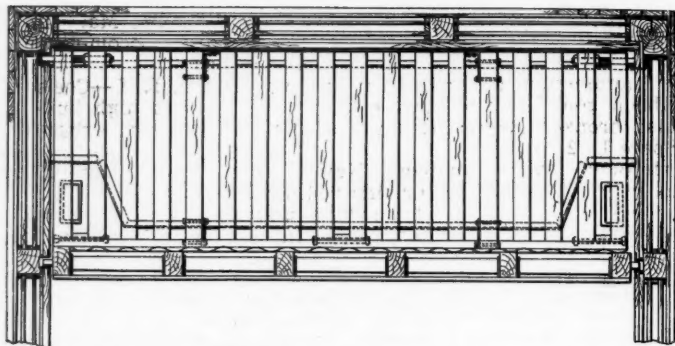
#### ADLAKE CAR LIGHTING FIXTURES.

The car lighting fixtures made by the Adams & Westlake Company, Chicago, rank high in design, construction, workmanship and finish. A valuable feature which is being used on many of this company's electric lighting fixtures is the Flex shade holder, an ingenious device for holding the shade by means of a flexible spring which grips it evenly all around, yet allows room for expansion. It does away with breakage, which is a common complaint where it is necessary to hold the shade with screws. The ease of operation which allows the quick shade adjustment saves much time, and, from an economical standpoint alone, the holder should appeal strongly to those interested in fixtures. A special circular describing the Flex holder has been issued.

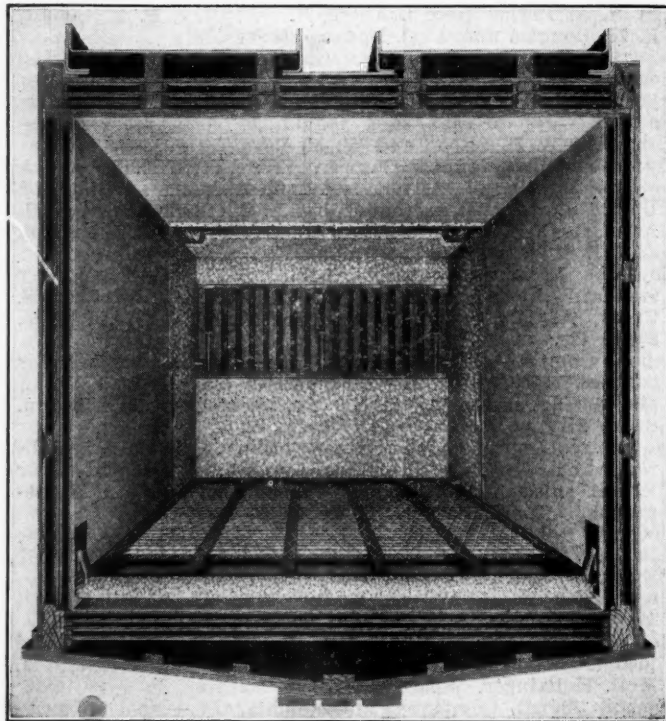
The car lighting fixtures made by this company, and sold under the name Adlake, include electric, acetylene gas, oil and candle fixtures, as well as combination fixtures such as electric and gas, etc. While one would think that from its large stock a selection could be readily made covering every requirement, the company is always willing to submit designs for fixtures demanded for special purposes.

#### REMOVABLE BULKHEAD PARTITIONS IN REFRIGERATOR CARS.

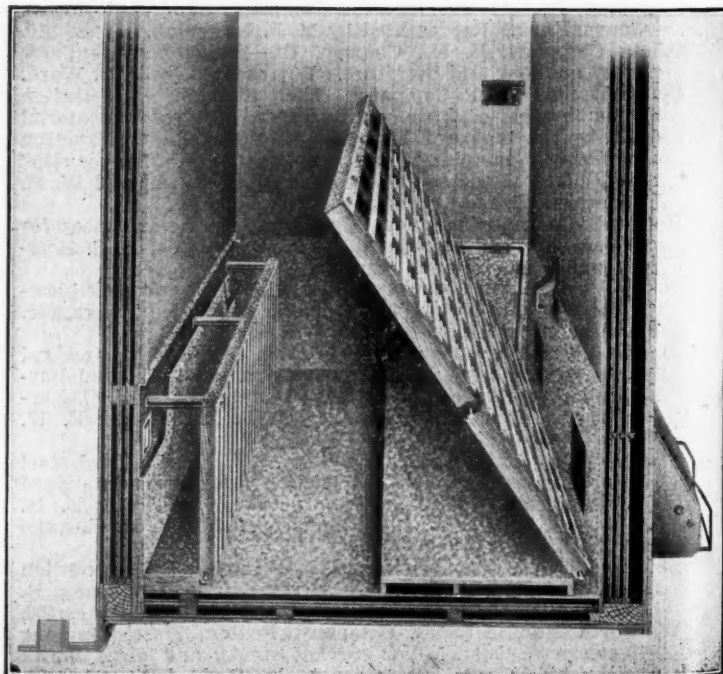
The White Enamel Refrigerator Company, St. Paul, Minn., has made some important improvements in its refrigerator cars so as to add largely to their cubic contents when icing is not required. The arrangement of the car when the bulkhead is in position for icing, as well as that when it is folded up so that the space can be used for freight, is plainly shown



White Enamel Refrigerator Company Bohn Folding Bulkhead, Plan View.

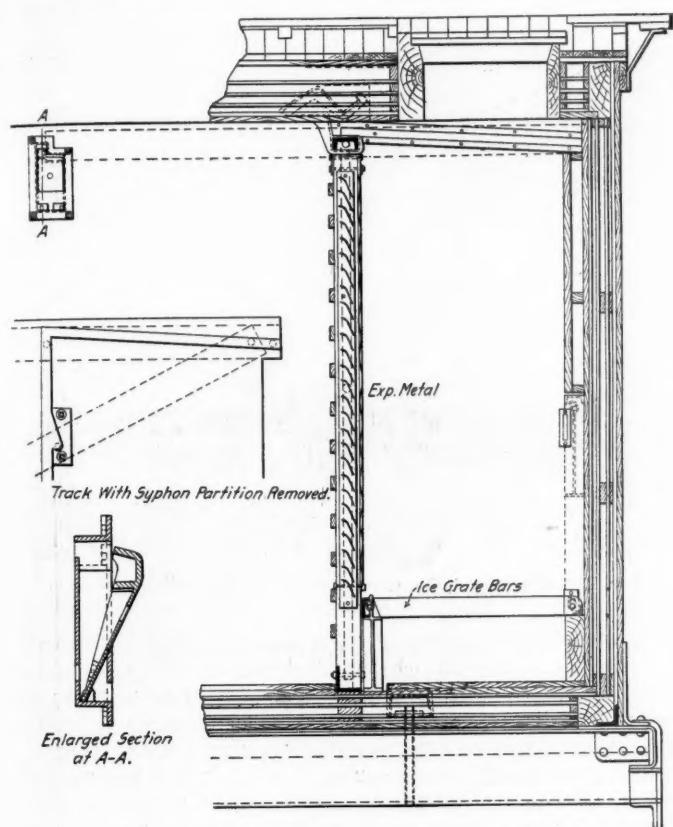


White Enamel Refrigerator Company Folding Bulkhead.



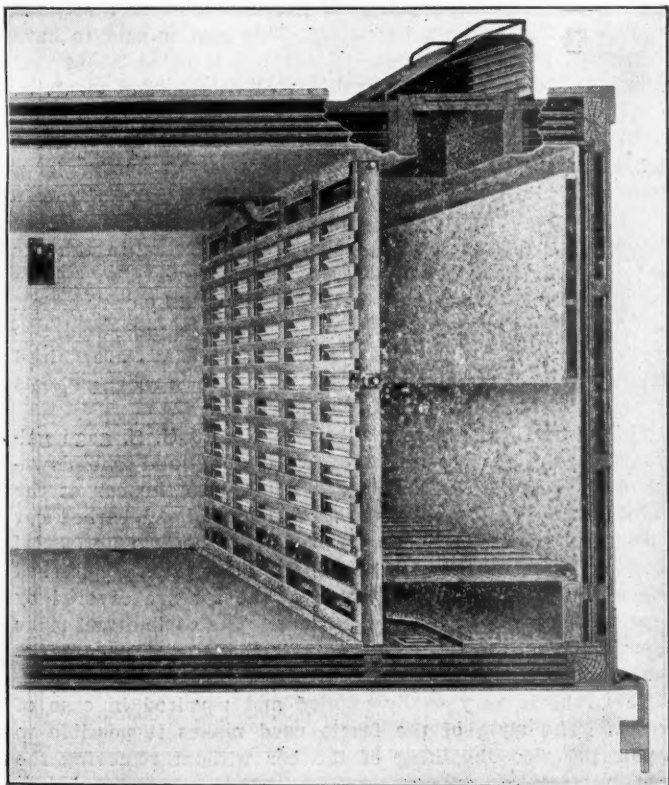
White Enamel Refrigerator Company Folding Bulkhead.

in the photographic illustrations and drawings. Each bulkhead has five sections of Bohn syphons 16 in. wide and 70



White Enamel Refrigerator Company Bohn Folding Bulkhead.

in. long. These are designed to raise up under the roof and the ice grates to fold against the end of the car. The syphon partition or bulkhead is made of 3 x 4 in. white oak standards fastened at the top to a 4-in. steel channel and at the bottom



White Enamel Refrigerator Company Folding Bulkhead.

with a 4-in. angle. Directly under the top channel, extending the full length of the partition and projecting at each end, are 1¼-in. round rods, which form a top trunnion that operates in a horizontal runway on the car side near the roof. The lower trunnions are bolted to the standards. When the partition is folded against the roof it is held there rigidly by a gravity lock fastened to the roof timbers, and on each side of the car is a gravity catch, also intended to hold the partition in position. The ice grate is made of 3 x 3-in. white oak bars held together by a 3-in. channel and 1½-in. angle irons. At each end of the rear of the ice grate is a 1-in. trunnion which works in sockets so as to make a hinge, allowing the grate to fold against the car end. This grate is supported in front by malleable iron legs, the rear resting on a 3-in. partition on the end of the car, and it is held in position by a small gravity catch fastened to the end bar of the ice grate. These fixtures are furnished complete, so that they can be installed in refrigerator cars by any car builder.

#### BETTENDORF EXHIBIT.

The exhibit of the Bettendorf Axle Company, Davenport, Ia., is in the same location, space No. 200, where it has been for the previous two years, and maintains its characteristic interest. This year the company is showing one 50 ton single center sill underframe, the same as will be furnished for the Harriman Lines, and also one 40-ton double center sill underframe, like those to be furnished for the New York Central Lines. There is also on exhibition a model of the Bettendorf all-steel box car. One of the special features of the exhibit is the Bettendorf truck, which will be dismantled and assembled for the information of any railway officials who visit the exhibit.

While the Bettendorf Company is not one of the oldest exhibitors at the Master Mechanics' and Master Car Builders' conventions, it has had each year for the last ten years a most interesting exhibit. The exhibit shows this year the construction that has been furnished by the company on recent orders. Probably there is no concern in the history of railway supply manufacturing that has made the wonderful growth of this company. The well merited success with which it has met has been due to the originality and practicability of the design of their product.

Many of the readers of the *Railway Age Gazette* will remember that only a few years ago, when all exhibits were much smaller, there was a small exhibit of the Bettendorf Company in the court yard of the Grand Union Hotel at Saratoga. The company at that time exhibited the Bettendorf bolster, which since then has seen service on so many thousands of cars on American railways. With the growth of the convention exhibits the Bettendorf exhibit has grown, and each year the company has had something particularly interesting to show to the members of the railway associations. At Washington, in 1905, the Bettendorf Company was one of the few larger railway supply firms which erected a building of its own for exhibit purposes. This added largely to the splendid effect at the Railway Appliances Exposition which was one of the important features of the International Railway Congress, held at that time.

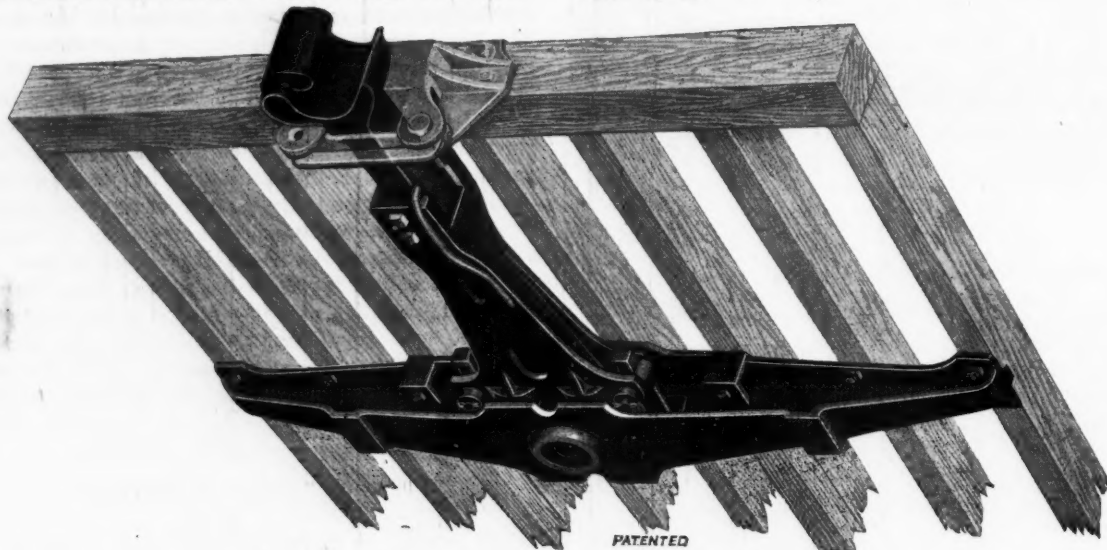
#### COMMONWEALTH TRANSOM DRAFT GEAR.

The Commonwealth Steel Company, St. Louis, Mo., at Booth 315, is showing models of its transom draft gear and making reports of the service being rendered by the large numbers of this device which are now in use.

The device receives all shocks on a strong, specially designed, body bolster, distributing them evenly to all the sills, and thus removing a large portion of the work from the

center sills. No draft timbers are used with this gear, which is strongly built and has but a few simple parts. As no rivets are employed in its construction, a quick change of couplers

stone River, which is extremely variable in character. Often it is extremely hard; at other times it is relatively soft, but very muddy.



Cast Steel Transom Draft Gear for Wood Freight Cars.

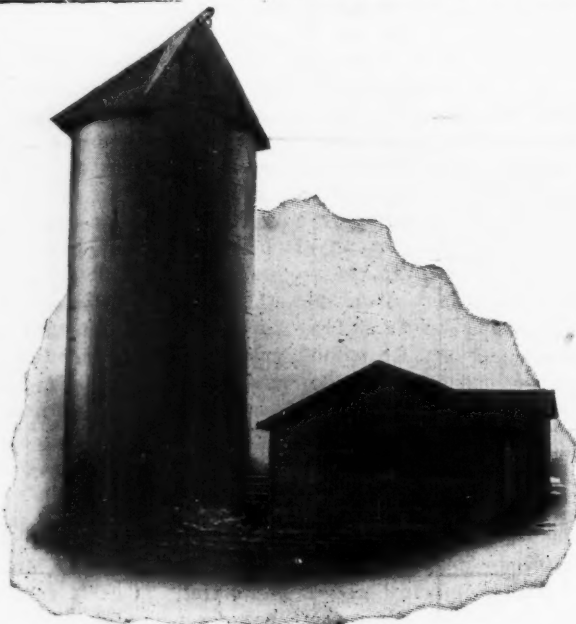
is possible. The device is designed to permit easy inspection and changing of the springs. The Commonwealth Steel Company has put the gear to rigid tests, and the large number in long service are said to have proven very satisfactory.

#### DUNHAM HOPPER DOOR DEVICE.

The Dunham hopper door, manufactured by the U. S. Metal & Manufacturing Company, New York, booth 337, is still breaking records, having been applied to over 30,000 cars to date. Its operation is evidently giving satisfaction to all concerned.

#### KENNICOTT GROUND OPERATED SOFTENER.

The Kennicott Company, Chicago Heights, Ill., has recently put in operation one of their new Type "K" ground operated softeners for the Chicago, Milwaukee & St. Paul at Miles



Kennicott Type K Water Softener.

City, Mont. The capacity of this machine is 12,500 gallons per hour. It is designed to treat water from the Yellow-

The well-known ability of the Kennicott softeners to handle a variable water ensures the success of the machine in spite of this difficulty. A special apparatus is included for putting in a coagulant at times when the water is muddy. The mechanism of this machine is similar to that of the many other Kennicotts in railroad service, but it has the relatively new feature of ground operation. All parts to which attention is necessary are located in a small house at the foot of the tank, and the man in charge is not required to climb up to the top of the machine. The weather at Miles City is frequently very severe, and this is a distinct advantage.

#### HUTCHINS ALL STEEL-STEEL CARLINE ROOF.

Details of the construction of the Hutchins all steel-steel carline roof are shown herewith. This roof is said to have had about five years' successful service, it being about that length of time since they were first applied. The most important feature of the design is that no roofing boards are used. It is flexible, and provision is made for the weaving motion of the car. The detailed construction consists of a number of Hutchins steel carlines, rolled by the Carnegie Steel Company, Pittsburgh, Pa., at its Clairton mills. These carlines are shaped to increase the head room in the car and are formed to suit any pitch of roof. They are bent down over the outside of the side plates and secured by one vertical bolt passing from top to bottom of the side plate and two horizontal bolts through its sides. The purlines are gained out for the carlines and form a support for the roofing sheets as well as a longitudinal brace for the car.

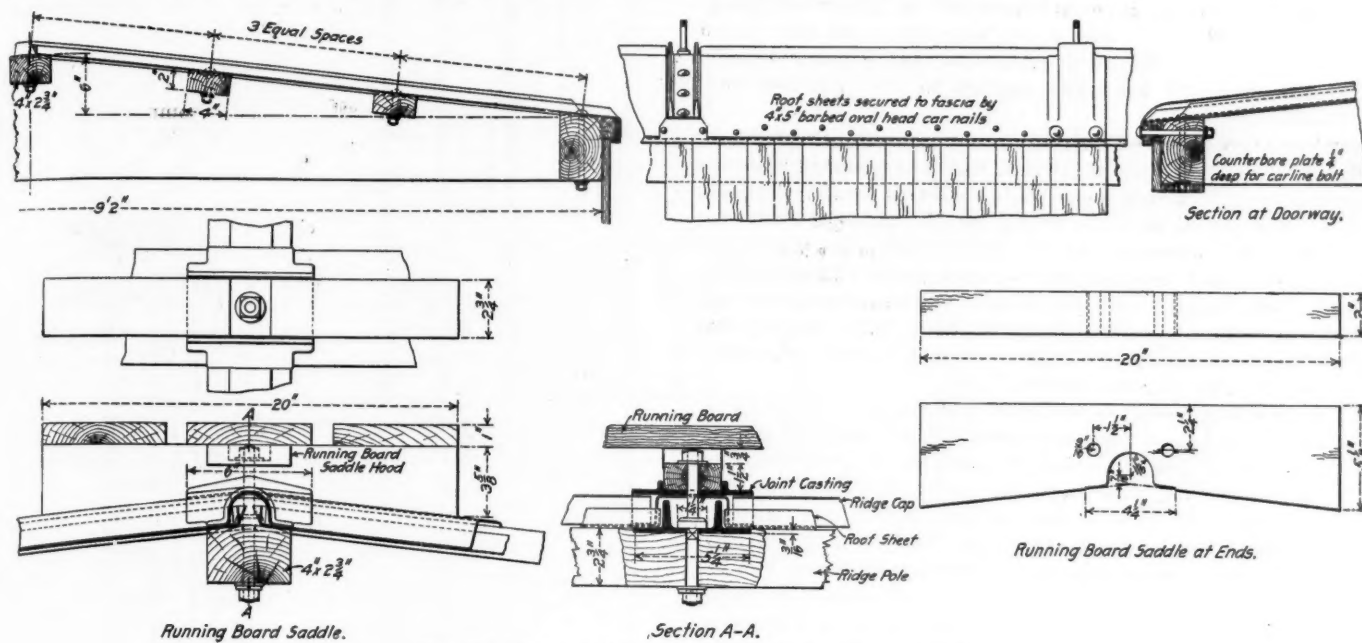
The roofing sheets are made from No. 16 U. S. gage galvanized steel plate with three upstanding and one down-standing flange. The sheets are secured to the car at the eaves and sides of the car with 4-in. oval head barbed car nails, the carline caps being secured by the two horizontal bolts that fasten the carline to the side plate. Upturned edges of the sheets at the ridge of the car are covered by caps which run between the carlines. The carline and ridge caps are made of the same weight of material as are the roofing sheets.

This roof is very easily applied and repaired in case of wreck. The style of the fascie used makes it possible to repair the side sheathing of the car without removing the roof or fascie.

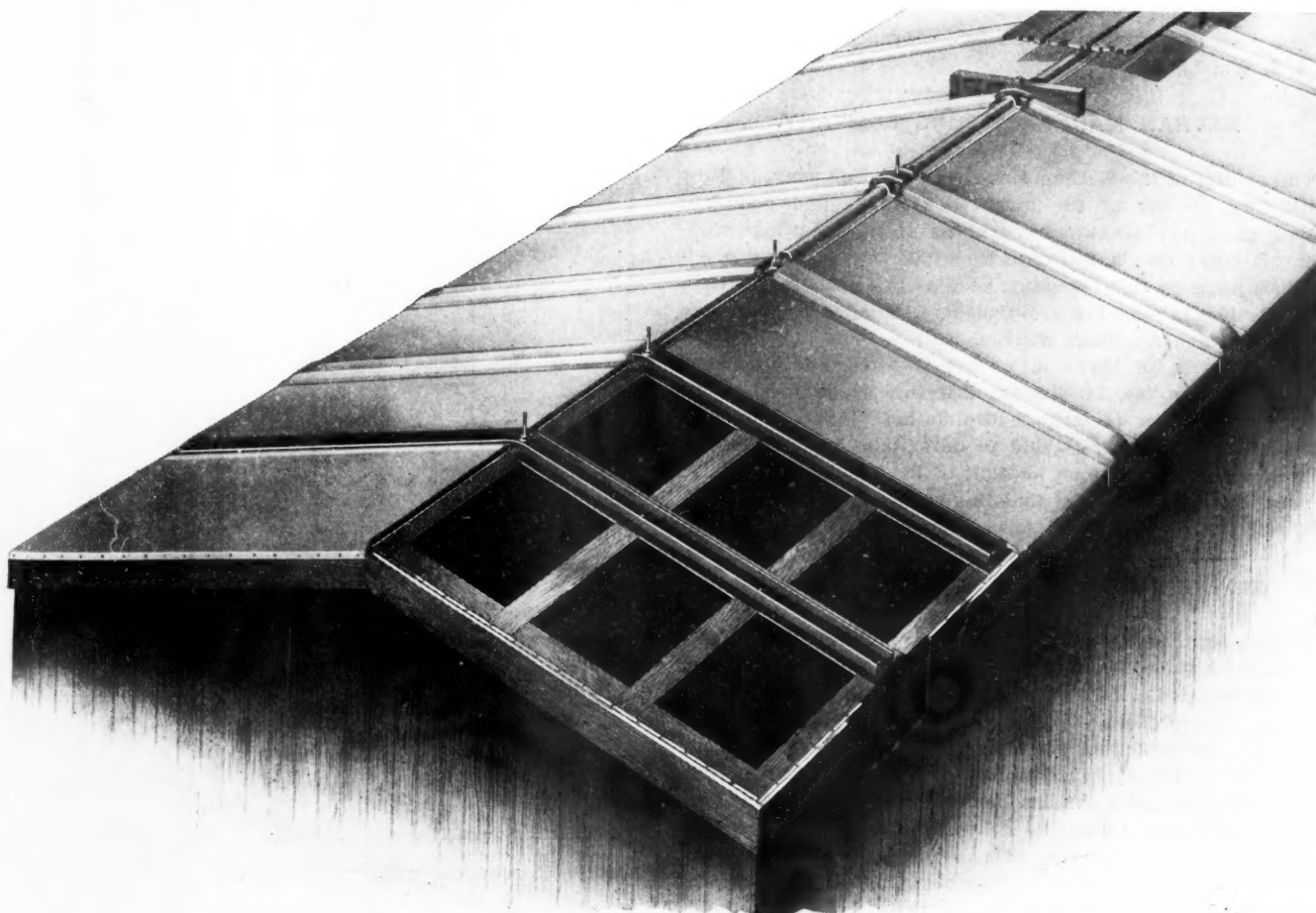
The No. 16 U. S. gage galvanized sheets have been for

some time in use as culverts and such other places where the material is subject to deterioration and faster than on a car roof. Under these conditions galvanized material is

company is represented in Chicago by the Spencer-Otis Company, Railway Exchange, and in New York by the United States Metal & Manufacturing Company.



Details of Hutchins All Steel-Steel Carline Roof.



Hutchins All Steel-Steel Carline Roof.

said to have lasted from 15 to 25 years. The Hutchins roof is designed to reduce the dead weight of a car from 500 to 1,000 lbs. and to increase the cubic capacity from 100 to 200 cu. ft.

The Hutchins Car Roofing Company, Detroit, Mich., manufacturers of this car roof, is exhibiting in space 431. This

#### WOOD'S NIPPLE END PROTECTOR AND BRACKET.

The depreciation of air brake hose due to abrasion is one of the principal items of expense in the maintenance of the brake rigging. Experience shows that a large part of this damage is done at the upper end of the hose and the life of

the hose is thereby reduced from three years to less than one year. The protection afforded by nipple end protectors should thus effect a very large saving. That this is the case is indicated by the sale of nearly half a million of these nipple end protectors. The coiled wire makes the hose quite flexible in spite of the metal protection, and it can be easily removed from old hose and applied to new hose of any standard size.

In the same booth where these protectors are exhibited are also shown the Monogram bracket, which is intended to overcome the common defects in the attachment to the airbrake train pipes which so often cause leaks. These are due to the insecure fastenings and the shifting of pipes when the cars are bumped together in switching yards. The shifting of the main  $1\frac{1}{4}$ -in. brake pipe loosens the connections at the cross over pipe, causing them to leak. The Monogram bracket overcomes this difficulty; and once applied, it largely reduces the cost of maintenance.

The hose angle cock is threaded into the end of the train pipe, which is held in the Monogram bracket located  $13\frac{1}{2}$  in. from the center line of the coupler and  $13\frac{1}{2}$  in. from the face line of the knuckle, and when the angle cock is set at the required angle of 30 deg. the locking key in the bracket engages the hexagon on the angle cock, holding it in position. The lock nut is tightened with a wrench, holding the key in position and locking into one solid piece of metal, the angle cock, bracket and train pipe; all parts being held in a positive position in a substantial manner, so that pipe shifting is positively prevented. This bracket is used on the steel cars in the Bettendorf exhibit.

The devices described in the foregoing are made by Guilford S. Wood, Chicago.

#### NATHAN MANUFACTURING COMPANY.

The exhibit of the Nathan Manufacturing Company, of New York City, is one of the most conspicuous and complete among the many noteworthy exhibits of this year's convention. It comprises a full assortment of the well-known appliances made by this company, such as injectors, lubricators, boiler testers, steam fire extinguishers, Klinger reflex water gauges and general boiler fittings.

The attention of those interested is attracted more particularly by the No. 14 Simplex injector, which is made to supply the boilers of large consolidation Mallet compound engines. This injector is said to be suitable for very heavy as well as light service on account of its enormous capacity, in connection with the fact that this capacity may be reduced fully one-half under normal service conditions.

#### BRINKERHOFF CAR SIDE CONSTRUCTION.

Forsyth Brothers Company, Chicago, are manufacturing and putting upon the market the Brinkerhoff steel passenger car side construction. This is something quite new and is in line with the present effort to obtain, particularly in steel car work, the maximum strength with the minimum weight and number of parts. Heretofore the girder effect in the side construction of a car has been only directly obtained as between the belt rail and side sill of the car. In the Brinkerhoff construction, however, this girder effect is extended clear up to the side plates. The post and letterboard are formed in one piece of sheet metal instead of being built up of separate parts and riveted together, thereby materially reducing the number of rivets and greatly strengthening these parts. The Brinkerhoff construction includes the use of diagonal bracing, similar to bridge trussing, with the difference that in this invention these trusses are all formed in one piece.

The shock-resisting properties of the Brinkerhoff construction was recently exemplified in a collision between cars

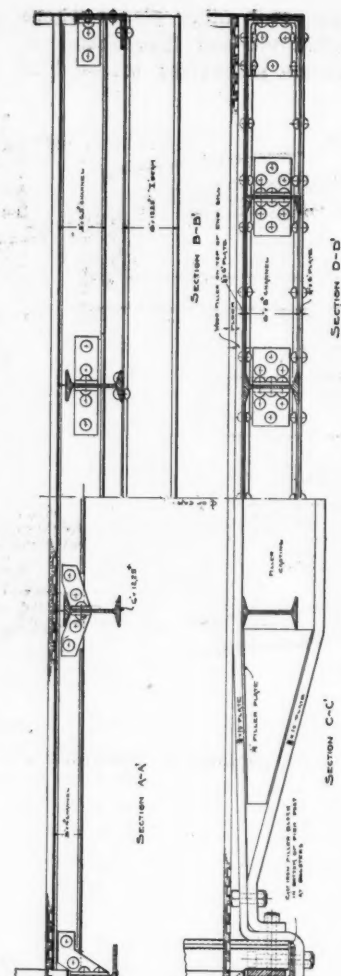


Fig. 3.

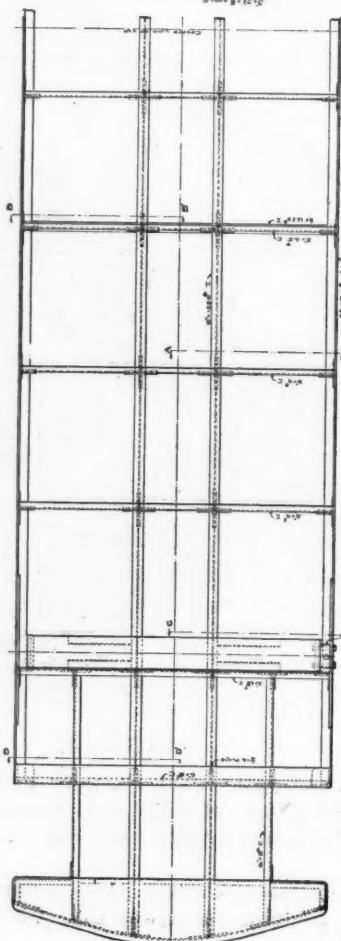


Fig. 1.

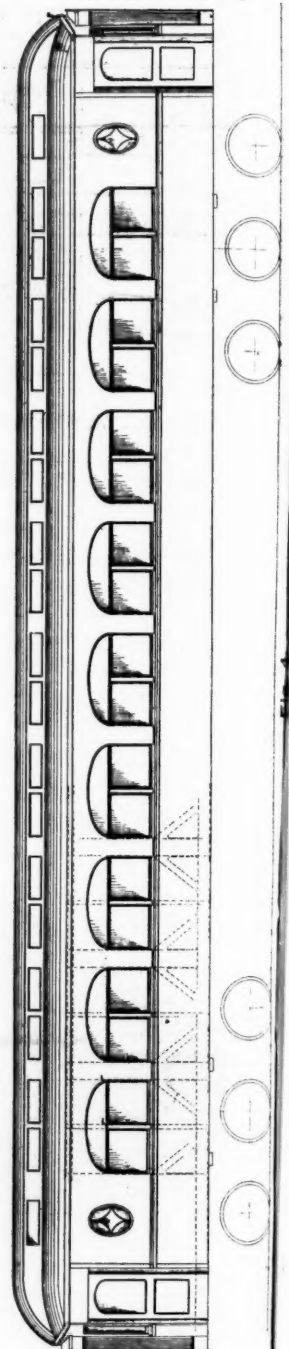
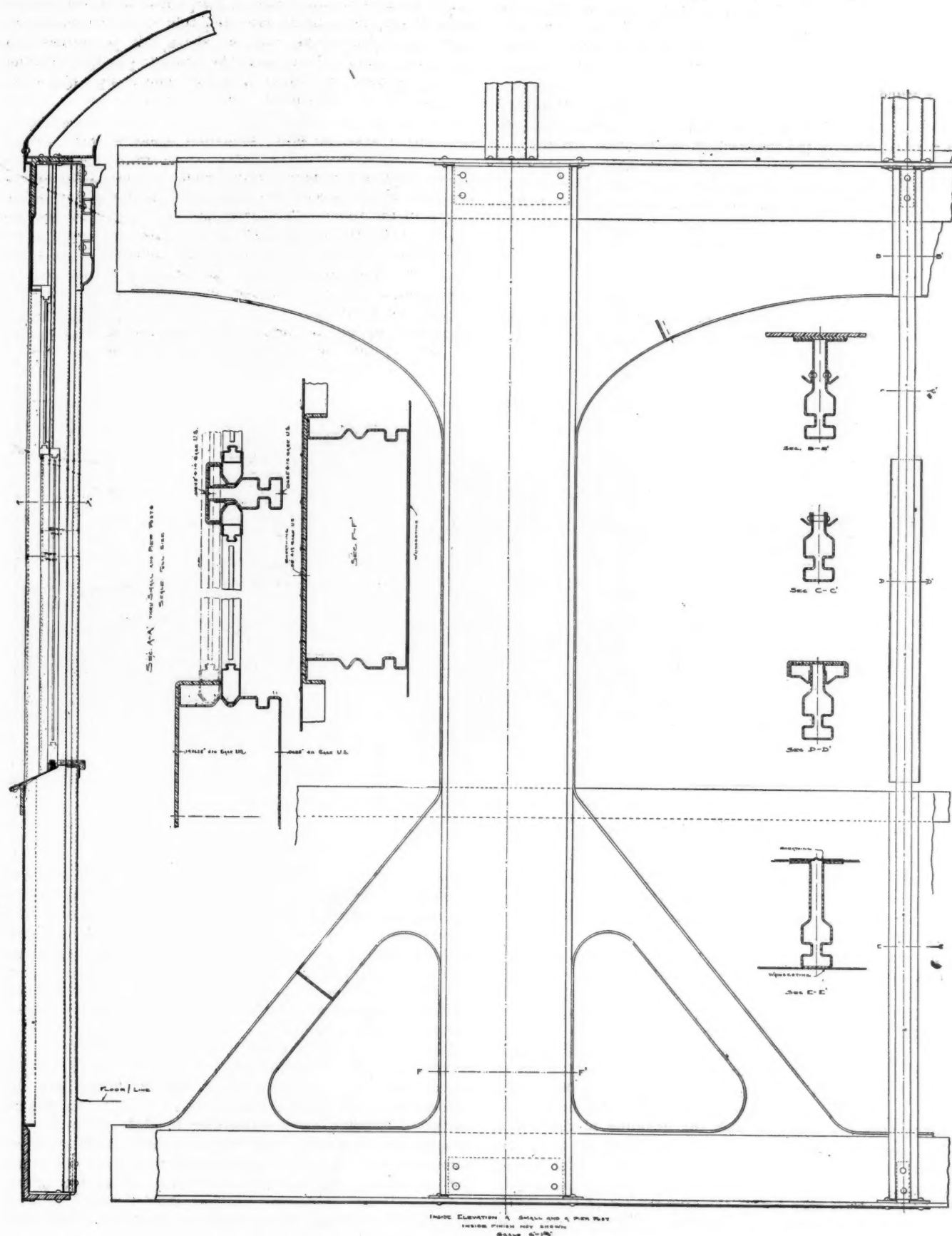


Fig. 2.



Brinkerhoff Side Construction for Passenger Cars.  
Detail of Posts and Side Frame as Under Fig. 4.

constructed according to the Brinkerhoff design, which came together at a considerable rate of speed. Practically no damage was sustained by the cars; none of the glass of the side windows was broken. The Brinkerhoff side car construction, therefore, provides a car having resisting properties not merely confined to the lower framing of the car but extending to the roof, thereby greatly adding to the total resistance of the car to shocks. Referring to the drawings illustrative of this construction, Figs. 1, 2 and 3, respectively, show side elevation, side plan, floor framing and cross sections through the floor framing of the Brinkerhoff construction adapted for elevated and subway cars. Fig. 4 shows side elevation of this construction suitable for steam railway passenger service. Fig. 5 shows details of post and side frame for car similar to that shown in Fig. 4. There are a number of cars in service of this type of construction.

#### FREIGHT EQUIPMENT.

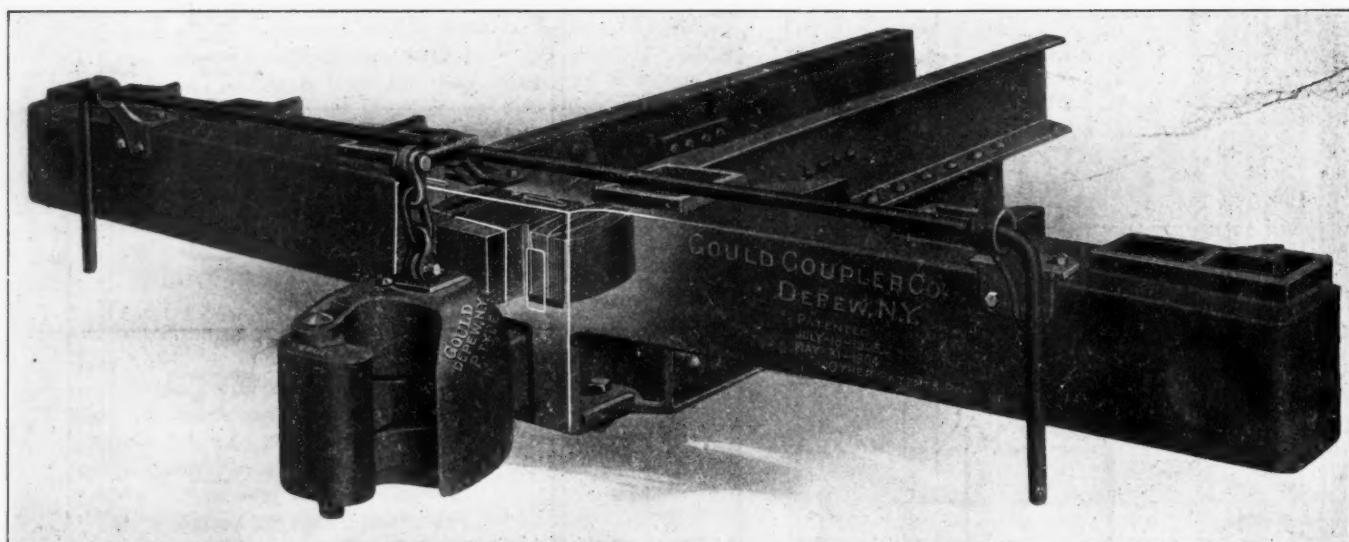
The Gould Coupler Company, Depew, N. Y., exhibited at the 1909 M. C. B. convention the first design of its cast

#### NEW PIPE BENDING MACHINE.

The machine shown herewith, which may be either belt or motor-driven, for bending pipe and tubing, is one especially adapted for locomotive and car shops. It is designed to bend 1-in., 1¼-in., 1½-in. and 2-in. pipe, the radius of bend varying between the limits of a minimum radius of 2½ in. for 1-in. pipe to a maximum radius of 12 in. for all four sizes of pipe.

The belt-driven machine has a single pulley, power being transmitted through three reduction gears to the vertical spindle holding the main forming roller. These main rollers are made in two pieces, the joint being at the center of the groove in the roller. The lower half is keyed firmly to the spindle, while the upper half may be raised or lowered by the handwheel shown at the top of the spindle. This dividing of the main forming roller is necessary to release the bend after it has been formed, particularly in the case of 180-deg. hot bends.

Fastened on to the former, and arranged so that it can be taken off and placed on any former, is a vise having



Cast Steel Freight Car End Sill with Friction Buffer Back of Coupler Horn and P. T. Type Coupler.

steel end sill with friction buffer. At the present convention the company exhibits a modified and improved form of this device, the changes being mainly in simplification and accessibility of the parts.

The design of the cast steel end sill proper can be made to suit any requirements and the friction portion arranged accordingly. The limited travel of 2¾ in. for friction draft gears has shown that it is not advisable to have them with a greater capacity than 150,000 to 175,000 lbs.

The friction buffer, which the horn of the coupler engages, is claimed to give an additional 100,000 lbs. resistance in buffing, but to avoid stiffening the draft gears for the pulling strains. This method of increasing only the buffing resistance does not interfere with the handling of the trains.

The device as arranged allows one inch between the coupler horn and the friction buffer, with the buffer having a travel of 1¾ in. This allows one inch travel of the coupler and friction draft gear before the engagement of the coupler horn and friction buffer. The additional buffing shocks taken by the friction buffer are in the direct line of the car underframe. It would appear that this is the proper method of obtaining additional buffing resistance in preference to additional coupler travel and increased friction draft gear.

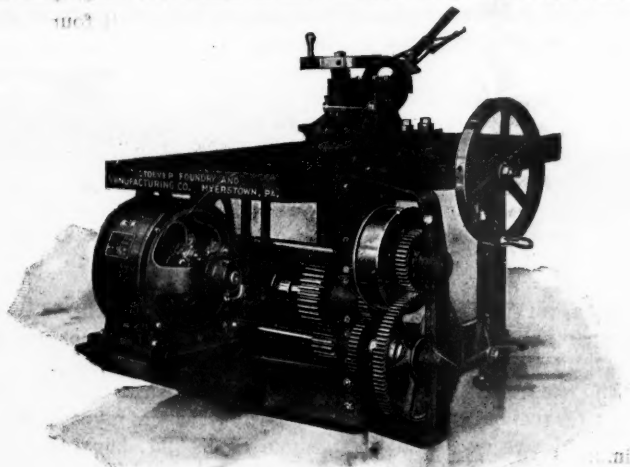
two universally adjustable grips operated by a hand lever. A carriage, or slide in the table, moves from the central forming roller, and is operated by a large handwheel. This slide holds two rollers, one directly in line with the main forming roller, and which serves to force the pipe or tubing into it, while the other is a guide, serving simply to keep the unbent portion of the pipe or tubing in proper position. This slide is made adjustable, so as to accommodate forming rollers of various radii.

The train of gears gives a reversed movement to the spindle, so that when the bend has been formed and removed from the machine a clutch can be thrown into this reverse train and the forming roller returned to its original position. Tapping arms, adjustably located on the vertical spindle and in contact with the adjustable stops on a rod connected with the clutch mechanism, will throw the clutch out on either the forward or reverse movement of the spindle at any angle or position, thus insuring absolute duplication of bends. The clutch can be thrown either way by the foot treadle.

The cut shows the motor-driven machine and the belt pulley in position. The belt-driven machine has but one speed, while it is customary to equip the motor-driven tool

with a variable speed, 3-h.p. motor, so that a variety of speeds can be obtained for making the different bends.

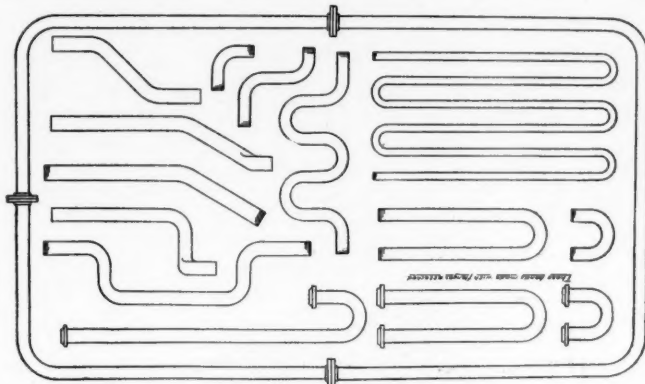
No filling of the pipe is necessary, the normal section being retained throughout the bend. As an illustration of the speed at which the machine can be operated, 16 complete bends are said to have been made in 10 minutes, and on daily runs 300 bends in nine hours. The ones referred to



Stoever Pipe and Tube Bending Machine.

were 180-deg. bends of 2-in. pipe made to a 4-in. radius, the length of the legs being from 5 to 6 ft.

As will be noted from the principle of operation, the machine is intended principally for manufacturing purposes. It is a special machine, like some forms of turret lathes and engine lathes, and when set up for a single piece of work



Sample Bends Made on Stoever Machine.

should be used on that work for some time.

Following are sizes of pipe and radii of bends made on this machine:

Minimum Radii—Cold Bends.		Minimum Radii—Hot Bends.	
1 in.	4 in. radius	1 in.	2 in. radius
1 1/4 "	5 " "	1 1/4 "	2 3/4 " "
1 1/2 "	6 " "	1 1/2 "	3 " "
2 "	8 " "	2 "	3 1/4 " "

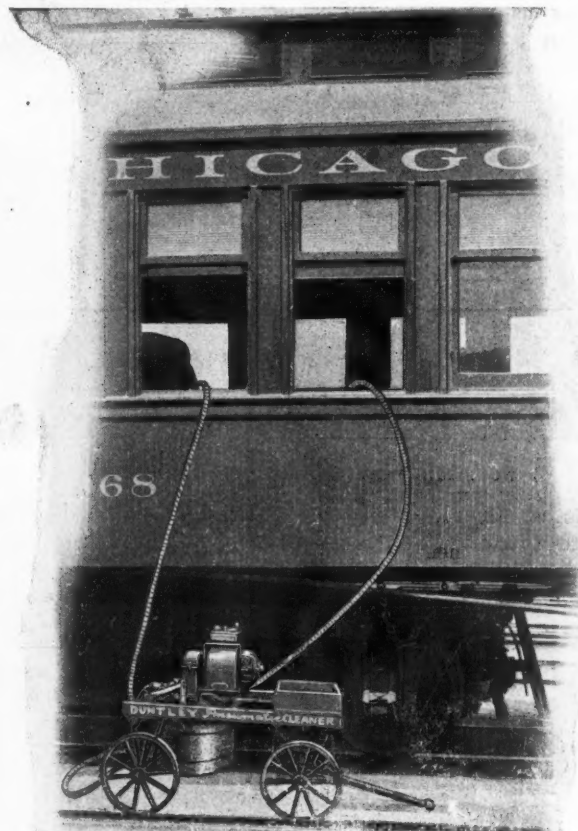
The belt-driven machine occupies 54 in. x 60 in. floor space, while the motor-driven machine requires 54 in. x 72 in. It weighs 2,500 lbs. without the formers.

The machine is manufactured by the Stoever Foundry & Manufacturing Company, Myerstown, Pa., whose sales offices are located at 140 Cedar street, New York.

#### COACH CLEANING AT TERMINALS.

The Duntley No. A pneumatic car cleaner has been especially designed by the Duntley Manufacturing Company, Chicago, to meet a demand in terminal car cleaning. It is mounted on a light truck with 20-in. wheels, and can be easily moved about the yards.

The electric machine is equipped with a 1 1/2-h. p. motor, adapted to any desired current. The vacuum pump is of a special design, only one ball bearing, 15-in. vacuum and a 75-ft. displacement. The exhaust air from the pump can be used for blowing dust and dirt from behind curtains, blinds, windows, from beneath seats, back of steam pipes, etc., as it has about 8 lbs. pressure and a large volume. It has been stated by officers of roads using this machine that one man



Duntley Pneumatic Cleaner as Used in Yards.

thoroughly cleans the seats of 12 cars in 10 hours, which is at the rate of 36 seats per hour.

The complete equipment includes one 12-in. carpet sweeper, two 4-in. renovating nozzles, a renovating handle complete, one 50-ft. piece of vacuum hose, one hose reducer and one blower nozzle.

This cleaner is adapted for cleaning the backs, fronts and cushions of seats, head linings, aisle strips and the general interior of the car.

#### SECTION HAND CARS.

It is the practice of the manufacturers and their representatives, when endeavoring to introduce new articles or an improvement on an old one, to make certain claims, such as greater efficiency, greater durability, fewer repairs, etc. These claims in many cases are necessarily almost altogether theoretical, particularly if it is an article where the special value lies in the comparative durability of the article, and it takes years to prove whether the claims are well founded. It is always a source of much gratification to the manufacturer, however, when in due time he is able to point to samples of his product which have not only come up to but exceeded any claims which he has made.

The photograph herewith shows a car made over fourteen years ago by the Sheffield Car Company. It is still in service, as is evidenced by the following quotation from a letter received from the section foreman having the car in charge:

"I send you to-day thirteen views of one of your fourteen years' service hand cars. This car has been in continuous service, on 1.25 per cent grade, on sections 105 and 106,

Rio Grande division, Texas & Pacific. Has never been shopped, although it has had the following repairs: Two complete sets of brasses, two bull wheels, and two pinion wheels and driving crank, and has been floored twice.



Fourteen Year Old Section Hand Car.

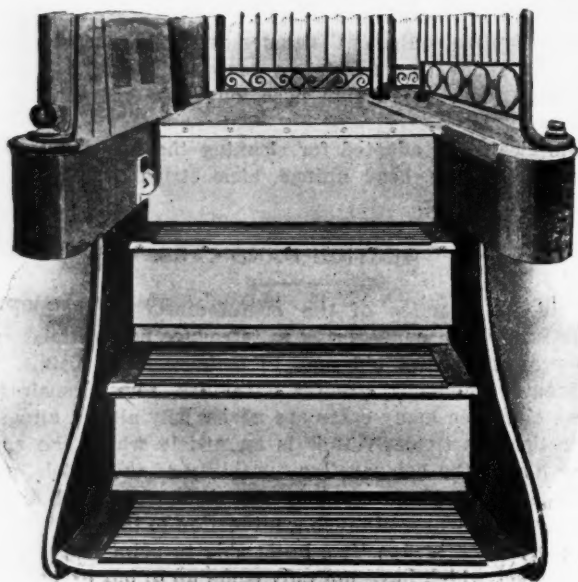
This car has run over 30,000 miles, and we have had from four to seven men on the car all the time. Have run it over this district for inspection many times."

The Sheffield cars are sold through Fairbanks, Morse & Co., Chicago.

#### MASON SAFETY TREAD.

The accompanying illustration shows the application to car steps of Mason safety tread, made by the American Mason Safety Tread Company, Boston, Mass. This tread is made in two styles: carborundum filled and lead filled.

The Barney & Smith Car Company, Dayton, Ohio, recently ordered a lot of lead filled Mason safety tread for the new



Mason Safety Tread.

cars it is building for the New York Central lines; and the Standard Steel Car Company has ordered the lead filled tread for 69 Pennsylvania Railroad passenger coaches, and is using the carborundum tread on the new Long Island Railroad cars.

#### SCULLIN-GALLAGHER I-BEAM BOLSTER.

The Scullin-Gallagher Iron & Steel Company, with foundry and general offices at 6700 Manchester avenue, St. Louis, Mo., one of the large manufacturers of cast steel body and truck bolsters, truck side frames and general railway steel castings, is having remarkable success with its I-beam type of body and truck bolsters, which are in general use on many of the largest railway systems of the country.



Cast Steel I-Beam Bolster.

With several hundred thousand of these bolsters in use, the percentage of failures from all causes in proportion to the total number in service has been only about .0007.

The Scullin-Gallagher Company attribute this to the inherent excellence of the I-beam design, which gives a maximum of strength with a minimum of weight, supplemented by the greatest possible care in maintaining that chemical analysis which will insure the quality of castings best adapted to the severe requirements of modern railway operation and the most modern foundry methods and equipment.

A truck showing typical designs of the company's bolsters is attracting the attention of many mechanical men at the Scullin-Gallagher exhibit, spaces 135, 137 and 139.

#### SPRINGS AND DAVIS STEEL WHEELS.

One of the features of the exhibit of the American Steel Foundries, Chicago, and which is attracting deserved attention, is the display of springs, made at this company's simplex plant. The springs, as shown by the accompanying cut, consist of both coil and elliptics for all classes of cars and locomotives.



Davis Steel Wheel.

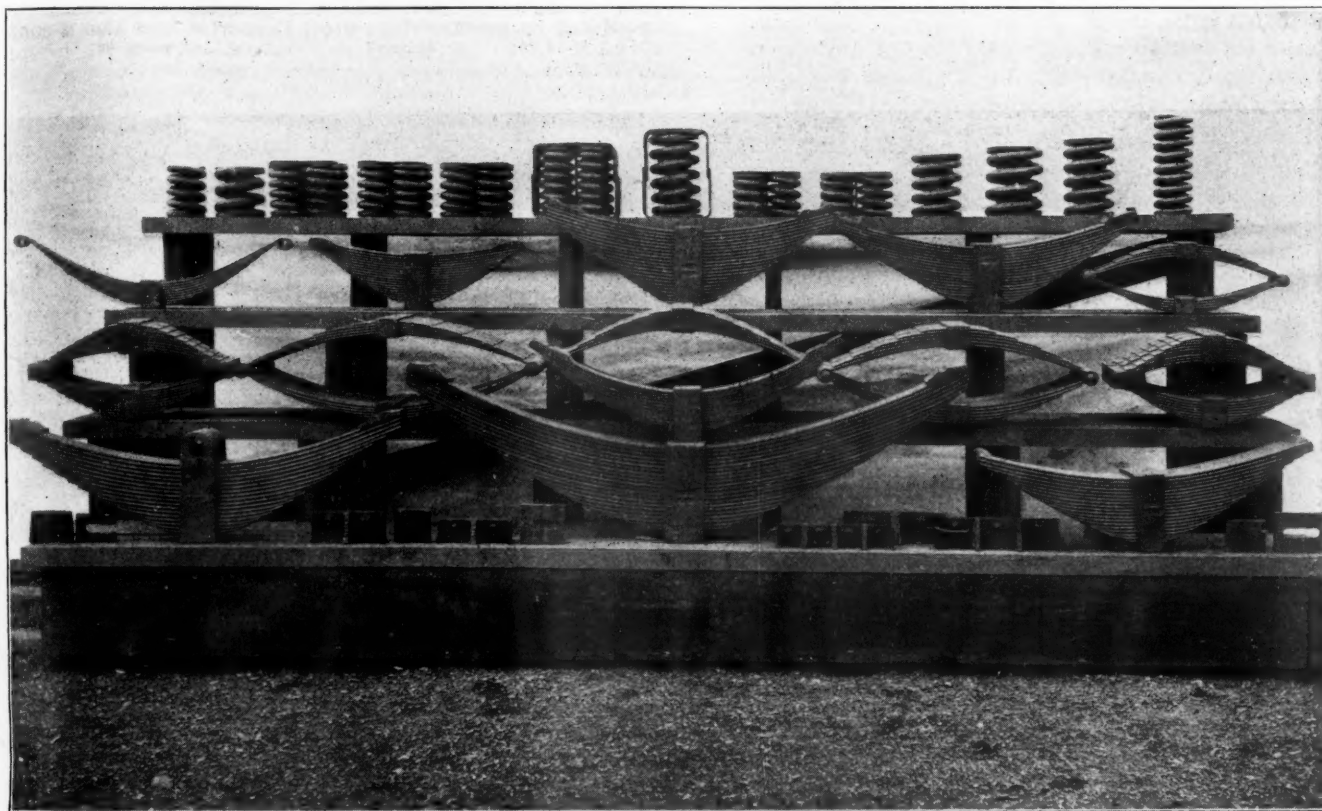
The large locomotive equalizer spring shown on the lower step of the stand in the center is said to be the largest locomotive spring ever manufactured and is of a type used on a recent order for Mallet compounds. This spring has a

total length of 6 ft. 4 in., and weighs 800 lbs. The 22 leaves are made of  $\frac{1}{2}$ -in. x 5-in. steel. Directly above this is a spring of similar design which was used on heavy consolidation engines such as were in use about 15 years ago. This spring weighs 150 lbs. and is composed of 14 leaves made of  $\frac{3}{8}$ -in. x 4-in. spring steel. The two springs shown on each end of the second step are for tender use, and are provided with Sloan rocker ends, which are said to have been very successful in eliminating the excessive breakage to which tender springs are subject.

Heretofore the upper and lower halves of elliptic springs have commonly been formed with scrolls or eyes at the ends, connected by pins. This arrangement has always been a weak one. The Sloan rocker ends are made of malleable iron, are simple, strong and economical and are adapted to connect the halves of single, double or triple elliptic springs.

can be duplicated. The controllers are used under any class of equipment in substitution of elliptic springs and are of particular advantage where the difference between light and loaded weight of car is very great. Their weight is about one-half that of the elliptic and the cost considerably less.

Due to track clearances, the proper strengthening of cast iron wheels to meet modern conditions has been a difficult problem and the manufacturers of cast iron wheels are entitled to great credit for producing a wheel which has given such general satisfaction under 30-ton, 40-ton, and even under 50-ton equipment in some cases where the service is light and track conditions good. From an original weight of about 525 lbs. for a cast iron wheel used under a 15-ton car, a weight of 700 lbs. has been reached for a wheel under a 50-ton car; an increase of about 175 lbs., or 33 per cent. There is some question as to just how much this increased



American Steel Foundries' Coil and Elliptic Springs.

In operation, the rocker ends retain the spring in proper relative position. Their center and side flanges keep the ends in alignment and prevent them from twisting out of true. The plates thus move easily as the springs are elongated or contracted, and afford a bed for the spring ends. With no load and with light load the weight is supported on the extreme ends of the spring, thus promoting easy running. As the load increases, the springs are compressed and shortened on the bed, thereby increasing the capacity and resistance in proportion to the load, in order to meet the needs of heavy locomotive tenders supported on elliptic springs.

On the top shelf of the rack in the center are shown Sloan spring controllers, a combination of a coil spring within a spring steel casing designed to give the same results as elliptics. The load forces the steel plate casings into contact with a resulting friction similar to that in the plates of the elliptic. The amount of friction necessary may be calculated and the easy riding qualities of any elliptic spring

weight has added to the strength of the wheel, since the weak point is the flange, where the track clearances limit the thickness of metal. While the weight of the wheel has been increased 33 per cent, the capacity of the car has been increased from 15 to 50 tons, or about 230 per cent. There has been a corresponding increase in the light weight of the car and the brake pressure as well as many other changes which have had a material effect in the service, so that the work generally imposed upon the wheel is many times as severe as it was formerly.

Believing that the logical wheel for freight equipment is one that will call for as little departure as possible from general existing practice, the American Steel Foundries have developed and perfected the Davis cast steel wheel. The Davis wheel is made of open hearth cast steel, poured into a revolving mould. Manganese is introduced into the stream of metal from the ladle in sufficient quantities to fill up the tread and flange of the wheel, leaving the center and hub of ordinary soft steel. As manganese steel is very hard and

tough, the flange is many times stronger than cast iron and the tread will have the maximum amount of wear.

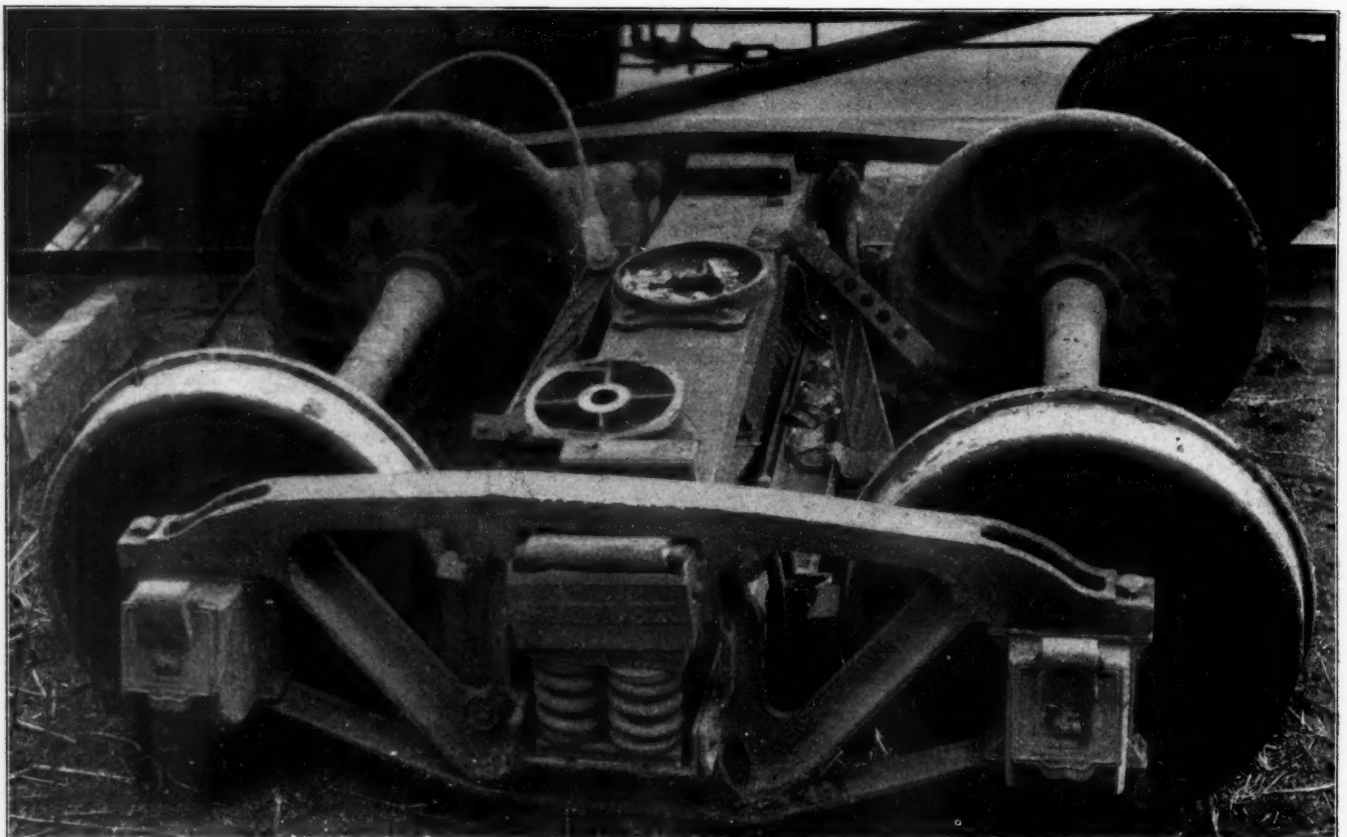
The American Steel Foundries are showing a number of Davis wheels, and service records which have been obtained during the year past entitle the wheel to the serious consideration of all interested in a solid steel wheel. Owing to the great strength of the metal used in the manufacture of these wheels, it has been possible to reduce the weight to about 600 lbs. each, making a saving in weight of 800 lbs. per car when compared with 700-lb. cast iron wheels used under 50-ton cars.

These wheels are ground before shipment, from the apex of the flange to the outside of the tread, so as to be perfectly round and to insure a perfect wearing surface. Davis steel wheels under locomotive tenders in fast local passenger service have shown 30,000 miles per 1-16 in. wear and under passenger cars there are many still in service which have run 160,000 miles.

truck bolster, cast steel body bolster, Simplex bolster springs, Ajax trussed brake beams and Susemihl roller side bearings. Trucks of this description have been adopted as standard by a number of the large railway systems, and are in service generally throughout the country where a truck of high capacity and low cost for maintenance is desired. The accompanying cut shows a truck of this design which went through an unusually severe freight wreck, practically no damage resulting.

To the left of the truck in the exhibit various types of couplers are shown, all in operative position. Directly back of the truck, on racks, are Simplex brake beams in a great variety of styles, while to the right of the truck and grouped along the side of the booth are shown Simplex springs, Susemihl side bearings, miscellaneous castings, Economy draft arms and a large collection of truck and body bolsters.

The walls of the exhibit are hung with some excellent photographs, showing large and difficult castings recently produced by the American Steel Foundries, and also a couple



American Steel Foundries' 50-Ton Freight Car Truck.

#### THE AMERICAN STEEL FOUNDRIES' EXHIBIT.

The American Steel Foundries, Chicago, have their exhibit in Machinery Hall, occupying Booths 157 to 168, a total of 1,872 square feet.

Most of the well-known products which the American Steel Foundries manufacture at their various plants are displayed in a pleasing and attractive manner, and are arranged, so far as possible, to show them as they would appear in actual service.

The center of Booth 168 is occupied by a full-size, fifty-ton freight truck, standing on a suitable piece of track with the necessary ties and crushed stone ballast. The parts of this truck manufactured by the American Steel Foundries consist of Andrews side frames, Davis steel wheels, Simplex

of colored pictures showing the appearance of an open hearth furnace when the charge is being tapped into the ladle, and when locomotive driving wheel centers are being poured.

The exhibit is well worth a visit from every railway representative attending the convention, and is a credit to the representatives of the American Steel Foundries, among whom the following have already arrived and are registered at the various hotels along the Boardwalk: William V. Kelley, R. P. Lamont, W. W. Butler, George E. Scott, D. W. Call, R. H. Ripley, J. C. Davis, T. D. Kelley, J. V. Bell, G. F. Slaughter, F. K. Shults, W. Ross Gravener, George C. Murray, Theodore Cook, P. J. Kalman, D. T. Harris, J. W. Dalman, A. R. Brunner, W. A. Blanchard, A. S. Crozier, T. H. Hopkirk, R. E. Janney, P. M. Armendariz, George G. Floyd, F. B. Ernst, C. E. Bauer, J. Soule Smith and Louis E. Jones.